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# ANIMAL LIFE IN AFRICA

## PART III. BIRDS, REPTILES & FISHES

BY

MAJOR J. STEVENSON-HAMILTON

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# ANIMAL LIFE IN AFRICA

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# ANIMAL LIFE IN AFRICA

BY MAJOR J. STEVENSON-HAMILTON
F.R.G.S., C.M.Z.S., LATE 6TH (INNISKILLING) DRAGOONS
WARDEN OF THE TRANSVAAL GOVERNMENT GAME RESERVES

Book III

## MISCELLANEOUS

(BIRDS : REPTILES : FISH)


LONDON
WILLIAM HEINEMANN

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# INTRODUCTION

I HAVE divided the present edition of ANIMAL LIFE IN AFRICA into three small volumes, each of them practically self-contained and dealing respectively with :

(1) The carnivorous or flesh-eating animals ; together with chapters on apes, monkeys, baboons, and some miscellaneous types ;

(2) The hoofed herbivorous, or vegetable-eating animals;

(3) Some of the birds, reptiles, and fishes.

A table of classification has been added in the form of an appendix to each volume.

Since natural history terms are not in everyday use, the following explanation of some of them may be found useful.

SPECIES : A group of animals which bear a very close resemblance to one another with regard to the most essential points of their bodily structure. Thus all domestic cats, though individuals may differ in colour, size and other points, are alike in the chief characteristics of their structure, and belong to the same species.

GENUS (*plural, genera*) : A group of animals consisting of one or more different species. Thus the lion and the leopard belong to different species of the same genus—that of the true cats. Animals belonging to the same genus are not so closely alike as those belonging to the same species, but they

have certain characteristics in common by means of which they are distinguished from all others.

FAMILY : A group of animals consisting of one or more genera. A family is, of course, a wider classification than a genus, and the characteristics which its members have in common are fewer in number. Thus a dog and a fox belong to the same family, though of different genera.

ORDER : An order is a still more comprehensive group, and consists of animals which are alike in only a very few special features. Thus all flesh-eating animals, to whatever family they belong, are placed in the order Carnivora, and all herb-eating animals in the order Herbivora.

CLASS : This is the largest group of all, and consists of animals which have the broadest and most general characteristics in common.

The principal of the eight classes into which the Vertebrates, or those animals which are possessed of a backbone, are divided are :

(1) MAMMALS : Warm-blooded animals which suckle their young.

(2) BIRDS, which are warm-blooded animals, covered with feathers, and usually, though not always, possessed of the power of flight.

(3) REPTILES, which are cold-blooded primitive animals, with a skin formed of horny plates or scales, but which breathe in the same manner as the foregoing.

(4) AMPHIBIANS : Cold-blooded primitive animals, whose young are aquatic and breathe through gills like fishes. Frogs, toads, newts, and salamanders are amphibians.

(5) FISHES : Cold-blooded aquatic animals, which breathe air through gills during their whole lives.

The above five large classes, together with three others consisting of small marine creatures, make up the Vertebrate sub-kingdom of the great Animal kingdom.

It might seem superfluous to go further and define what an "animal" really is, were it not that there occurs not infrequent misconception on the point. An animal, then, is that which can be classed neither as a vegetable nor as a mineral, and so the term includes all birds, reptiles, fishes, and insects.

Other descriptive terms used are explained in the text. A few of the most common, however, are, for convenience of reference, given below.

ARBOREAL : Used to describe animals which live in, or habitually frequent trees.

NOCTURNAL : Used to describe animals which lie up during the daytime and issue forth to hunt their food, &c., at night.

MIGRATORY : Used to describe animals which wander regularly or occasionally from one region to another.

PACHYDERMS : Thick-skinned animals, such as the elephant, rhinoceros, and hippopotamus.

UNGULATES : Hoofed animals.

SPECIALIZATION : The development of an organ of the body in some special direction. In whatever degree groups or species of animals have developed peculiarities of structure distinguishing them each from older and more simply formed groups or species, so are they described as being more or less highly specialized.

ENVIRONMENT : The surroundings of the animal, and the external conditions with which it constantly comes into contact.

RUDIMENTARY: An organ is said to be rudimentary when it is not fully developed, or is in an early stage of development.

PLANTIGRADE: A term applied to animals which walk on the soles of their feet, and on what in human beings would be the palms of the hands (elephants, bears, &c.).

DIGITIGRADE: A term applied to animals which walk upon what would be among human beings the points of the toes and the ends of the fingers. The wrist and heel thus become what are termed in the horse the knee and the point of the hock respectively. Among the carnivora the first joint of the fingers becomes a pad on which the animal walks, and the nails, instead of solidifying into hoofs, as among the majority of the herbivora, become claws for scraping or for holding prey. The large majority of both carnivorous and herbivorous animals are digitigrade.

FAUNA: The fauna of a country implies its animal as distinct from its plant life (flora).

RUMINANTS: Ungulates which chew the cud.

BOVIDÆ: That large family of the ruminants which have their horns in the form of a hollow sheath enclosing a bony core and do not cast them annually like the *Cervidæ* or deer family. Cattle, sheep, and antelopes belong to the *Bovidæ* family.

ANTELOPE: This term is popularly applied to those of the hollow-horned ruminants which are neither cattle, sheep, nor goats. It is incapable of any clearer definition. Some tribes of antelopes appear more nearly to resemble the cattle and buffaloes, others the goats.

J. STEVENSON-HAMILTON

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# ANIMAL LIFE IN AFRICA

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## PART I

## BIRDS

### CHAPTER I

### MIGRATIONS OF BIRDS

NINE hundred and twenty species of birds, including the European migrants, have been described from south Africa up to the present, while throughout the continent at large, classification has made considerable progress. For zoological purposes the northern limits of the sub-continent are usually taken to be the Zambezi and Cunene Rivers, that is to say, roughly sixteen degrees of south latitude. North of this, central and east African types of mammals and birds begin to show themselves. A high range of mountains sometimes apparently affects the distribution of birds, and species may occur on one side which are not found on the other.

The question of the migrations of birds has recently received a good deal of attention in south Africa. Many species, as is well known, spend the summer in Europe or in north Africa, and come south again before the cold weather begins ; most of these are birds which breed

in the northern hemisphere, though individuals of certain species are said to remain occasionally all the year in the south, and nest there. Others again are purely African types, which go no further north than the tropics to spend the cold southern winter, and information is required as to exactly where some of them go to. As regards the European visitors, while some authorities have maintained that the migrants from farthest north wend their way farthest south, others suggest the reverse. During the last few years some very interesting experiments have been carried out among the white storks. Societies in Germany and Hungary have adopted a method of attaching aluminium rings to the legs of young storks while still in the fledgling stage, with the result that birds marked in Germany have been found a few months later in north-eastern Rhodesia, Bechuanaland, and Basutoland; while others, which came from Hungary, were discovered in Natal, the Transvaal, Basutoland, and the Orange Free State.

In order, so far as possible, to arrive at some rough idea of the times of arrival and departure of various kinds of migratory birds, the Transvaal Museum has, for some years, been in the habit of sending to various likely people in south Africa a list of species, with the request that they will note, on a card sent for the purpose, the date on which they first and last noticed each, together with the direction of the wind at the time.

Although the replies were unfortunately far fewer than might reasonably have been expected, still, enough were sent to form, even up to the present, very interesting data. Thus, white storks seem to begin to arrive about the middle of October, and depart from February onwards until April. European rollers arrive in October, and leave in March. Bee-eaters are resident from October

till the beginning of May. European swallows begin to arrive about the end of September, and the last of them leave about the first week in May. Of African migrants, the stripe-breasted swallow remains from September till April in south Africa; the carmine-throated bee-eater from September till the end of March. In fact, there is a general arrival of all visitors about the beginning of October, and an exodus at the commencement of the following April.

## CHAPTER II

### THE OSTRICH : BUSTARDS : DIKKOPS

THE OSTRICH. The ostrich belongs to the sub-class of flightless birds, devoid of any keel to the breastbone, and scientifically known as *ratitæ*. It is, further, the only representative of its family, and is distinguished by the absence of all but the third and fourth toes on each foot.

Ostriches exist throughout the greater part of Africa, in suitable surroundings, but they are absent from the forest regions of west Africa and the Congo, and have not been met with in Nyasaland, nor in northern Rhodesia. This blank on the map forms a neutral zone between the southern race and those found through the northern part of German East Africa and Somaliland.

An extreme northerly form also exists in Arabia.

It was not until about the year 1870 that ostrich farming was seriously adopted as an industry in the Cape Colony; but in these forty years it has made enormous strides, both in scope and in the improvement of the birds by selection. In 1874 the weight of feathers exported was 36,829 lb., valued at £205,640, while in

1904 the amount had risen to 470,381 lb., valued at £1,058,988. In these thirty years, consequent on the increasing supply, ostrich feathers had sunk from £5 11s. 7d. to £2 5s. per lb. In east Africa, too, the industry is progressing well, and the quality of the birds is good. The ostrich, therefore, may be fairly considered to have taken his place among the useful domestic servants of man.

Wild birds at present exist (in south Africa) in the north-eastern Transvaal, southern Rhodesia, and the southern part of Portuguese East Africa, besides Bechuanaland and German South-West Africa. There are large numbers in the Transvaal Game Reserves, from the Crocodile River to the Limpopo, a distance of some three hundred miles, principally in the flats at the base of the Lebombo Hills. Such experiments as have been undertaken with wild birds in the Transvaal have not, however, so far been very successful, the quality of the feathers of the bush-bird being inferior to the Cape variety.

During the mating season ostriches are generally seen in pairs, a cock and a hen bird; less frequently several hens accompany one cock. The cock and the hen together excavate the nest, which is merely a large circular hollow scraped in the bare ground, often far from any trees or other shade. In this the eggs, about twenty in number, are laid. Those of the southern ostrich are of a very light straw colour, pitted with little depressions, whilst in the east African and Somaliland forms the depressions are of darkish colour, and in the northern type are altogether absent. The hen bird sits on the eggs by day and the cock relieves her at night, so that the eggs are never left unguarded during incubation. The birds sit with their necks extended straight along the ground, and the grey feathers of the hen by

*Sabi Game Reserve, Photo*

OSTRICH CHICK

day and the black ones of the cock by night are very hard to distinguish.

In the eastern Transvaal the nesting period seems to lie between August and January. I found twenty-one eggs in a nest on the 18th August, and one taken had a partially developed chick inside. Another nest, containing eighteen eggs, was found on 28th December; the young ones were just ready to hatch out. I have also noticed very young chicks in October. On the Athi Plains of British East Africa the season seems very much the same. The incubation period lasts from five to six weeks, and on coming out the chicks are helpless for the first day, but after that speedily become active. If young ostriches are being artificially reared, great care must be taken that they are kept warm at night, as they are extremely susceptible to cold.

Wild ostriches feed on various leaves, twigs, seeds and small plants, which they cover great distances to seek. To assist digestion they swallow stones and other hard objects. They are amongst the wariest of game, and are very fleet of foot, running with their heads held back and wings clear of the thighs. Unfortunately for them, their habit of going in wide circles deprives them of much of the advantage derived from their speed. A cock ostrich can deliver a blow from his foot equal to the kick of a horse, and tame ones are often dangerous at certain times of year. Their habit of "waltzing" has often been described. After leaving the nest the chicks accompany their parents until well grown, and later the birds are sometimes found associated in large troops, which probably are temporary collections of various family parties.

The chief enemies of the full-grown ostrich are the lion, the chita, and the hunting dog. The lion stalks

the bird in the ordinary manner, the chita runs him down after crawling up as near as possible before making its dash, while the packs of hunting dogs are so well aware of the ostrich's weakness that they always run the diameter of the circle which he is describing. The two latter species of carnivora, however, prefer, when possible, the hens and half-grown birds as quarry. During the incubation period, the eggs are well guarded against the onslaughts of the birds and lesser beasts of prey ; but before their tally is complete they are often left unprotected, and then hyænas, jackals, bush-pigs, and the like often wreak wholesale destruction. If, on her return, she finds that the nest has been tampered with, the hen is said to desert it and lay a fresh clutch elsewhere, previously breaking up the remainder of the eggs herself.

There are various stories current in some parts of Africa to the effect that vultures or other birds of prey will carry up stones into the air and drop them on to ostrich nests in order to break the eggs therein. The best rule when listening to an improbable story is to keep a perfectly open mind about it until an opportunity of personally testing its truth arrives. I think it was the "roc" in the "Arabian Nights" that used to carry up big stones and drop them on to persons and things it did not like ; but I never saw any bird in real life do such a thing. However, many birds of prey do carry up into the air and drop tortoises, in order to break their shells, and it is quite possible they might do the same thing with ostrich eggs, though I should imagine most of them would have no difficulty in breaking them with their beaks without going to the considerable trouble of flying away with them.

The call of the male ostrich is a loud booming some-

times mistaken at a distance, and by a novice, for the roar of a lion. Millais, in "A Breath from the Veld," devotes an interesting paragraph to this matter.

## Bustards

This family is represented in south Africa by eleven species. They eat insects, berries, and seeds, and lay two eggs to a clutch.

The Giant Bustard. This fine bird, which attains to a length of about five feet, a wing spread of eight feet and a half, and a total weight of forty pounds, is met with through east, central, and southern Africa. It favours rather open country, covered with scattered bush. Its flight, though heavy, is rapid, and it can make excellent use of its legs also. It is generally seen singly or in pairs ; sometimes a female with her latest offspring. It is an extremely wary bird, and seldom permits approach within fifty or sixty yards, even where unaccustomed to persecution. Mounted hunters sometimes adopt the plan of riding narrowing rings round it, which method seems occasionally to confuse and keep it on the ground.

The species appears locally migratory, and I have noticed it in particular areas only at certain times of year.

The Stanley Bustard. This, the second largest of the genus, is partial to open country and hilly uplands, and is met with in the high country of east and south Africa.

Ludwig's Bustard is another fine bird, measuring over three feet in length. It is migratory in habit, and its environment is that of the last species.

There are eight species of lesser bustards, locally known as knorhaan, described from South Africa, all

of which are excellent sporting birds. They get up suddenly and go away with a heavy, but fairly swift flight, some species uttering loud and raucous cries. When believing themselves unobserved they crouch on the ground with their necks stretched straight out in front of them, and often endeavour to escape by running through the grass with their heads held very low.

The best known in the bush country is the Red-Crested Bustard, so called from the reddish tuft of feathers on the nape of the male, more pronounced during the breeding season, and fading soon after death. Like all its family, it is rather solitary in habit, being found usually singly or at mating times in pairs. It rises suddenly and silently and has a way of zig-zagging through the trees when flying away, thus affording a very sporting shot. Its call is a series of single notes, harsh and frequently repeated; when uttering them the skin of the throat is puffed out like a bladder.

The most remarkable habit of this bird, however, is the "towering" of the males. Towards sundown the cock bird will suddenly rise straight into the air, higher, and yet higher, above the sea of bush, until at a height of over a hundred feet he pauses, as if suspended, with flapping wings. Suddenly closing the latter tightly to his sides he drops towards earth like a stone. With such velocity does he fall that to the onlooker it seems that he must be dashed to pieces; but in a moment the wings are once more outstretched, and with a couple of graceful circles he alights safely and easily, to rise once more and repeat the performance. I think these aerial gymnastics probably have some connexion with the pairing season, or atmospheric conditions, as it is by no means always possible to witness them, and,

while on some evenings a dozen birds may be in sight in the air at one time, months may pass without anything of the kind occurring.

THE DIKKOPS. Two species of these are described in south Africa, the Cape Thickknee and the Water Thickknee. Like the bustards they are three-toed birds, and are found in pairs or small parties. They have a silent flight and a curious method of walking and running, the head being jerked forward with each step. They crouch and hide in the grass and bush even more than the knorhaans.

## CHAPTER III

### GAME BIRDS

Guinea-fowls : Pheasants : Francolins : Quails : The Sandgrouse : Snipe : Waterfowl

MOST of the African game birds are contained in the family which comprises the guinea-fowls, so-called pheasants, francolins and quails. Consequent on their many natural enemies, their numbers within any given area fluctuate very much from season to season. Thus, after a wet summer, when the grass has been long, providing plentiful cover, and a good supply of insect and other food, they are usually numerous ; but when conditions are reversed, young and old birds suffer so much, and so few eggs get the chance of hatching, that their total is relatively small in the following winter.

THE CROWNED GUINEA-FOWL. This is the common guinea-fowl of south Africa, its range extends northwards to about south latitude fifteen degrees and roughly between longitudes twenty degrees and thirty-five degrees.

It is seldom found far from water, and, though partial to feeding in the open in the evenings and early mornings, during the heat of the day shelters itself in thick bush and long grass. Through the winter months these birds are seen associated in enormous flocks, and at this time frequent the neighbourhood of native villages, where they pick about among the lands for insects and grain. At night they roost in trees and thick bushes, frequently those overhanging water. The pairing time comes with the first rains, and thenceforth the birds are only found in couples in the densest bush, and entirely desert the neighbourhood of human habitations. In my experience, therefore, they do practically no harm to summer crops, and I think the occasional agitation against them on that account is founded on an entire misconception of their nature and habits. About March or early April, in the eastern Transvaal, the parent birds lead forth their broods, and the flocks once more begin to assemble. In spring the colours on the bare skin of the head and neck become much brighter in the cock birds. From seven to ten eggs are laid in a clutch, and the spot is so well chosen that the nest, a small scraped-out depression amidst long grass and thick bush, is most difficult to locate.

Their food consists of seeds, bulbs, grass, and other roots, and insects; they do an enormous amount of good in destroying locusts and their eggs, quartering the ground for the latter when they discover the breeding-ground.

Guinea-fowls drink, in the winter, just at sundown, but in hot weather often at sunrise also, and I have seen a flock come down to the water at 3 P.M. in September. They are very early risers, and at grey dawn they may be seen briskly moving over their feeding-

grounds, very little in the way of food escaping their notice. At such times they have an amusing way of ruffling their feathers and chasing each other. They are great runners, and most difficult to flush; when they do rise it is with a great deal of noise and fuss; the flight is straight, and they are very easy birds to shoot. Pursued by dogs, they seem to lose their heads and then take refuge in the nearest large trees, from which they show considerable disinclination to move. I have, in fact, seen a single dog, by running backwards and forwards barking from one to the other, keep guinea-fowl treed in half a dozen places at the same time.

Their call is a raucous "ka-a-a-k, kak, kak, kak," which is instantly recognizable when it has once been heard.

They domesticate readily. Mr. Sanderson used to have a great number about his farm, but, though so tame that they would even come into the house after food, the commencement of the breeding season saw their departure to the bush, whence they would not return for several months.

Probably few creatures have a larger number of enemies, so conspicuous does their congregation in flocks, and their large size, render them. By day a bird of prey, sailing above in the blue, constantly excites the utmost terror and consternation amongst guinea-fowls in the open, and causes them at once, with much cackling, to scuttle for the nearest shelter. By night every tree-climbing creature, from the leopard downwards, takes its share of toll, while all the host of other predatory beasts are ever on the alert to seize their opportunity. Civilized man with his gun, and savage man with his snares, exact at all times a heavy tribute; but in spite of it all, given favourable summers, with plenty of food

and covert, the species holds its own amazingly well. I did not believe that such enormous numbers could exist in any one area as I saw in 1899 on the middle reaches of the Kwando. The country on the west bank was uninhabited, and there were stretches of swampy grass land extending from a fringe of thick forest to the river's brink. In the late evenings these places used to be one mass of guinea-fowl on their way down to drink, and one found it difficult to comprehend whence came the food to supply such countless numbers.

In ~~German~~ British South-West Africa, northwards to the Cunene River, the place of the above species is taken by a nearly allied one, distinguished by the crown or helmet being bright red instead of bluish black.

In Portuguese territory north of the Zambezi, and through all east Africa, the species met with has a small conical and pale-coloured helmet. Its habits are as those of the others; but in Portuguese Nyasaland I noticed a custom prevalent amongst the flocks which is foreign, in my experience, to the crowned guinea-fowl. After the conclusion of the morning foraging expedition, instead of going away to spend the heat of the day in the long grass or low scrub, they would fly up into the branches of large trees growing in swamps or surrounded by dense undergrowth or cane-brake, and remain there until the late afternoon, when they would come down to feed.

There are some four other species of crowned guinea-fowls known in Africa, and that which I saw on the upper Nile seemed not at all to differ in habits from its cousins in the Transvaal.

THE CRESTED GUINEA-FOWL. This is a very handsome bird, its head covered on the top with a crest of curly black feathers. The rest of the plumage is black, mottled

with light blue spots, and there are chestnut markings on the breast.

The crested guinea-fowl is never found associated in the large flocks characteristic of its crowned relative. It is of most retiring habits, and small troops of only six or seven individuals are met with in mountainous or thickly bushed country. Its range extends from Natal and Amatongaland, where it used to be pretty numerous on the top of the Lebombo Hills, through the coast lands of Portuguese East Africa. Several other allied forms are described from different parts of Africa.

THE VULTURINE GUINEA-FOWL is an inhabitant of the eastern part of Africa. It is a strikingly handsome bird, the head bare of feathers, the neck, wings, and flanks being coloured a bright blue.

THE AFRICAN PHEASANTS. These birds (about equal in size to English partridges) are distinguished by their throats being bare of feathers, and generally brightly coloured. They are usually great runners, and often most difficult to flush, so that they are not very sporting birds. They are found in more or less thickly bushed or forested country, and at no great distance from water. There are about nine species recognized in Africa, of which three are found south of the Zambezi. Of these three, two are known respectively as the northern and the southern red-necked pheasants; both have the bare skin round the eye, and on the throat bright red. The former, which is distributed between about 15° and 25° south latitude, has reddish black legs, and in both species the males have strong and sharp spurs.

The food of the former consists of insects, bulbs, berries, and grass seeds, which latter I have seen individuals jumping up to pick. The bird is very fond of

small grain, and often hangs about villages in quest of scattered millet seeds, and does some damage to ripe crops of this kind. It drinks well before sundown and daily, feeding its way down to the water, and often flying back therefrom to the bush. In habit it is solitary, except at the pairing season and when the mother is looking after her latest brood, which remains with her until almost full grown. It roosts in trees, but the nest is made on the ground concealed among grass and brushwood, and, like those of most other game birds, is merely a slightly hollowed-out depression lined with feathers and grass. I found a nest in March containing five eggs, and on 3rd May I saw a female with three young ones, apparently about a couple of weeks old. On the 28th of the same month, also in the neighbourhood of the Selati Railway in the eastern Transvaal, I met a single hen in the path. She ruffled her feathers and acted generally as if she would dispute progress, after a while running off with her wing dragging in the recognized manner of mother birds. A short search revealed the presence of a single very young chick in the grass by the path side ; there may have been others, but the natives and myself were unable to find them. On the other hand, I have noticed coveys of young birds fairly strong on the wing, in the same district in April ; so that I fancy the nesting season in the Transvaal low country, at all events, is not very regular. The cocks of this species are very fond of perching on the top of a dead tree or some dry branch, where, with a good field of view, they sit uttering their raucous call of "kwa-ri, kwa-ri, kwa-a-a-ri," which is responsible for their native name in south-east Africa.

When running they hold their heads very high and their bodies almost vertical. They are easily caught in

traps baited with grain, and I have had several young birds running with my fowls at different times. When fully grown they quite naturally prefer the society of their own kind, and forsake the safety of domesticity for the freedom of the bush.

The other, or southern, form of red-necked pheasant exists in the wooded districts of Cape Colony and Natal, and extends as far north as the eastern Transvaal, where individuals are sometimes, though very rarely, found on the borders of the low country among the foot-hills of the Drakensberg. This (lat. 25° S.) forms about the extreme north limit of their range, and they are very uncommon there. They are easily distinguished from the kindred type by their red legs.

The White-Ringed Pheasant has the bright red bare skin on the throat surrounded by a pure white band; the ear covers are white, and the bill and legs bright red. It ranges as far south as the Inhambane district of Portuguese East Africa, where it is quite numerous, and near the coast appears to take the place of the red-necked type. It inhabits very dense bush, and has the tree-perching and roosting habits of the other species. It extends northwards into British East Africa.

THE FRANCOLINS. This genus contains over forty species in Africa. They differ greatly in size, ranging from the little coqui, to the big Jackson's francolin of east Africa. Unlike the pheasants, they are feathered on the neck; the males are usually provided with spurs. They are, as a rule, more ready to take to the wing than the pheasants ,and so find greater favour with sportsmen.

The Natal Francolin is a very common bird in the Sabi and Olifants areas of the Transvaal. It is found in wooded country, near rivers and spruits; favouring

especially the thick bush by their margins, and may be recognized by its red bill and legs and white breast with V-shaped black markings.

Its feeding and drinking habits are very similar to those of the red-necked pheasant. It is a much shyer bird, and is less frequently found near villages. When disturbed it goes away with a strong and noisy flight, uttering harsh cries of alarm, and generally takes refuge in the branches of some leafy tree or bush at no great distance from the ground. It is also a good runner. It is usually seen in family parties, but the cocks sometimes go singly. I have seen coveys of young birds in April, and found a hen sitting on a clutch of six whitish eggs on 8th December near the Sabi River ; but I also caught an unfledged one on 31st May, and noticed a newly hatched-out brood on 24th August in the same district, so that the nesting appears to occur very irregularly. The nest is hollowed out of the ground and hidden in the usual manner. A not uncommon ruse of single birds to escape detection when perched in a tree is very quietly to creep round to the other side of the trunk, thus interposing it as a protection. By walking very slowly, so as to lead it to believe itself unobserved, and at the same time gradually working round, you will see it again slip round the tree; and it will continue to do this so long as it imagines you have not noticed it. It roosts in trees at night.

This francolin ranges from Natal northwards. An apparently kindred type exists in the Kikuyu forest of British East Africa, at a height of 8000 feet. This species was laying in early October there, and I found a nest containing five fresh eggs.

The Crested Francolin is a smaller bird than the last. Its colour is rufous brown, merging into olive on the back, the feathers having very conspicuous white shaft

marks ; underneath it is light buff, with dark shaftings on the upper breast, which gradually become finer. The legs are red, and the cock bird has a very sharp pair of spurs. Its range is very much that of the northern red-necked pheasant, and farther north it merges into other nearly allied species.

The crested francolin is found in thick bush or open country usually near rivers and permanent water. It is solitary in habit, and very wary and shy. When disturbed it runs through the undergrowth at a great pace, and when flushed flies low and fast, often rising with a bush between itself and the intruder, and seldom giving a fair shot in the open. After its flight it usually settles in a tree or bush, whence it once more shoots away when followed up. Its food consists of insects, seeds, and bulbs. I have seldom noticed it in the lands near my residence on the hunt for grain, though it abounds in the bush close by. A good many young birds may be seen fairly strong on the wing in February, but I have observed male and female still paired in April. The young birds remain in small coveys with their mother until not quite full grown, when they separate. I found a nest of this species on 26th April. It was situated amid long grass surrounded by dense bush, close to a small dry sandspruit. The nest was merely a shallow hollow scraped out by the bird herself, and there were three eggs in it. The latter were tawny white, in colour, covered, especially towards the thicker end, with very small pits of less size than pin-heads. One egg was more thickly spotted than the other two. They were rather conical in shape, the length being 1.72, breadth at thick end 1.34, at middle 1.43, and at thin end .8 inches. This species, too, roosts in trees or bushes.

ORANGE RIVER FRANCOLIN

*Pretoria Zoological Gardens Photo*

The cock birds are often seen sitting in the middle of a thick thorn bush, and their grating calls are continually heard in the mornings and evenings.

Shelley's Francolin is about the best sporting bird of the genus in the Transvaal low country. It favours lightly timbered and open country, and I have never seen it in the thick bush. It is a handsome bird, with white throat surrounded by a black line, a mottled black and white breast, and yellow legs. It sits very close, and is generally found in small coveys. It roosts on the ground, and is a great insect eater.

The well-known Cape Redwing and Cape Partridge are confined to the high country of south Africa, and both afford good sport.

The Coqui is the smallest of the genus. The crown of the head is reddish and the sides of the face yellow, which, with its size and its bright yellow legs, render it easy to recognize. It is widely distributed and is found in most of Africa south of the Equator. It is usually met with in small coveys, in open bush country near water. It is a ground rooster, and sits very close. When flushed it flies well and strongly. This was one of the very few species of francolin which I noticed between Ibo and Lake Nyasa.

As the coqui is the smallest, so Jackson's francolin is much the largest of the genus. It is, in fact, nearly as big as an English pheasant. I met with it in some low scrub near the foot of the Laikipia plateau in British East Africa. It is named after Mr. F. J. Jackson, C.B., C.M.G., the Lieutenant-Governor of that colony (now Governor of Uganda), who discovered it.

All the above pheasants and francolins benefit the farmer in that they prey largely upon the eggs and young of locusts, as well as eating other insects.

QUAIL. Three species of quail belong to south Africa ; each is migratory in habit. The Cape Quail is a sub-species of the European quail, and is that usually met with by sportsmen in south Africa ; but the type common to the Transvaal eastern bush country is the Harlequin Quail. It appears and disappears with remarkable suddenness, and rather irregularly ; but, generally speaking, it arrives in the low country at the end of the wet season—about April—and remains until August. I have seen large numbers in April, after an exceptionally wet season, when the grass was very long, and I have noticed pairs in August. That the natives recognize its departure towards the end of the winter as being fairly regular is manifest from their current superstition that a month or two before the rains the quails all turn into rats. This belief is due to the fact that, towards the close of the dry season, pickings of all kinds become scarce in the veld, and so the quails migrate, and the rats, seeking the comparative plenty of the villages, swarm thereto in hosts.

Button Quail. Three species of Hemipodes, or button quail, exist in south Africa. They are smaller than true quail, solitary, and partially migratory in habit.

THE SANDGROUSE. Four species are described from south Africa : the Yellow-Throated Sandgrouse, the Spotted Sandgrouse, the Double-Bended Sandgrouse, and the Namaqua Sandgrouse. Of these the double-banded sandgrouse occurs in the bush country of the eastern Transvaal. The crown of the head and the forehead are white divided by a black band, and the upper parts of the body black mottled with yellow.

The double-banded sandgrouse appears to be locally migratory in habit. It prefers dry and often stony surroundings, with plenty of sandy soil. In exceptionally

wet summers the birds disappear altogether from their usual haunts, while, if there is only a small rainfall, they remain throughout. For instance, during the summer of 1906–7, which was very wet, I do not recollect having noticed any, while in the following one, which proved extremely dry, they were present all the time. In 1908–9, again, little rain fell before Christmas, and plenty of sandgrouse were seen, but they disappeared as soon as the heavy rains began in January. After a couple of weeks of dry weather in the middle of the rains I have noticed their reappearance, so that I fancy they do not remove farther than perhaps, the higher and drier sand-ridges, where they are less likely, under ordinary circumstances, to be encountered.

They are normally seen in pairs ; sometimes a considerable number will be noticed feeding, or resting in the heat of the day under trees, but when disturbed they always break up into couples. In the gloaming, between sunset and dark, they assemble at the drinking-places in flocks, sometimes of hundreds. Scuttling about on the sand, they utter their queer little crooning song of seven notes, playing and chasing each other. They remain as a rule but a few minutes, and then, as night closes in, come speeding back with a whirr of wings, and at a tremendous pace. In fact, whether when proceeding to, or departing from, the water, the speed at which they travel, coupled with the uncertain light, makes this form of shooting one of the most difficult possible. When flushed by day the pairs get up very suddenly and quietly, and fly fast, with a rather zigzag flight.

I found a nest in the country north of the Sabi on April 30. It was merely a little depression scraped in the dust, and absolutely in the open ; there was no

lining to it of any kind. It contained two eggs covered with brownish blotches; they were an exact oval in form and measured 1.55 by 1.1 inches. On August 26 I saw a young one just able to fly.

Three species of snipe are found in south Africa: one purely South African, one a European migrant, while the third (the Painted Snipe) resembles, in habits and appearance, a rail rather than a snipe.

## Water-Fowl

Many parts of Africa are extraordinarily rich in water-loving birds, and I shall never forget my first glimpse of the Zambezi near Lealui, where the enormous swamps collect millions of wild-fowl of all families and species; and form a real paradise for the sportsman. Geese, ducks, teal and widgeon, pochards and shovellers, ibises, herons, flamingos, and all the host of lesser water-fowl, here find a home. The ear is filled and confused by their varied cries, and of an evening and morning their long "flights" may be seen streaming in every direction from and to their various feeding-grounds. Great is the contrast to this scene of life and activity which meets the eye of the traveller amid the dismal sudd swamps of the upper Nile. Here, on every side stretches a scene of weary solitude—a wilderness of reeds and feathery papyrus, unvaried by a sign of visible life, excepting an occasional solitary and meditative shovel-bill, which, hermit-like, finds content in the lonely uniformity of his surroundings.

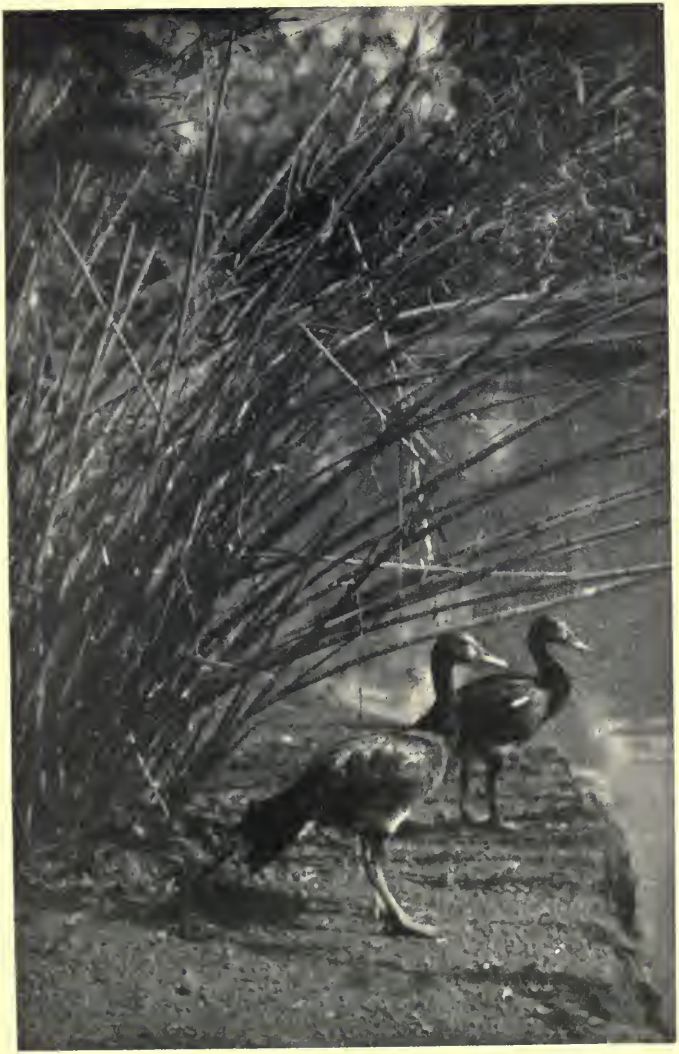
The largest and one of the best known of African geese is the Spur-Wing, which extends right through the Ethiopian region, from the White Nile southwards. It has a sharp spur springing from the bone of the wing, and is often met with in considerable flocks. It is very

shy and wary. The flesh of the old males is tough, leathery, and strong tasting. It has an occasional habit of perching on trees, a custom which it shares with some other species of African water-fowl. The Egyptian Goose is another very widely spread bird, ranging through the greater part of Africa. In south and south-central Africa it usually occurs in pairs.

The Knob-Billed Duck is very common on the Upper Zambezi, and is elsewhere distributed through most of Africa. The curious knob on the bill from which it derives its name is present in the males only. I have seen these ducks perching upon quite high trees. They are seen in the eastern Transvaal, like others of their order, only as occasional migrants ; but immediately to the east of the Lebombo Hills, in Portuguese East Africa, they may often be noticed on the numerous small lakes and pans which exist there.

Other species common to south Africa are the Dwarf Goose, the Yellow-Billed Duck, the Black Duck, the Red-Billed Teal, the Cape Widgeon, the Hottentot Teal, the Maccoa Duck, the White-Backed Duck, the south African Pochard, the European Shoveller, the Cape Shoveller, the White-Faced Duck, the Whistling Duck, and the south African Sheldrake.

Of the above, the south African Pochard, sometimes known as the " diver," is partially migratory in habit in south Africa, though north of the Zambezi it is met with in large flocks all the year round. As its familiar name implies, it seeks its food by diving entirely under the water, remaining sometimes beneath the surface for a considerable time, and swimming with only its head and neck protruding.



SPUR-WINGED GEESE

## CHAPTER IV

### BIRDS OF PREY : EAGLES, KITES, THE SECRETARY BIRD

THE birds of prey, of which Africa contains its full share, are divided into two orders, the first containing the eagles and hawks, the vultures, the osprey, and the secretary bird, while the second comprises the owls.

It is a great mistake to regard all birds of prey as hostile to man, and therefore to destroy them whenever and wherever found. Besides the vultures, which are recognized as useful scavengers, and are therefore protected in South Africa, many other kinds deserve to be spared, not only on account of their scavenging habits, but for the immense amount of destruction they wreak among snakes, rats, and other noxious creatures.

Some years ago a writer in one of the agricultural journals advocated that all eagles and hawks should be shot at sight, and suggested that a good opportunity offered when they were seen indulging their rather favourite habit of perching on telegraph wires. Putting aside the probable injury to the wire, I cannot conceive any more ill-advised suggestion than to recommend the general public, which cannot be expected to distinguish the few harmful from the many useful species, to act in this way. A saner advice would be to recommend the killing of members of the predatory species of birds only when found hanging round chicken runs, and generally near human habitations where they seem bent on mischief, for, though there are ill-conditioned individuals which have acquired bad habits in every species, that is no reason why the great majority, who are doing useful

work away in the veld and forest, should be shot out in their native haunts. An individual dog sometimes acquires the habit of worrying sheep, and has therefore to be destroyed, but we do not think it necessary to decree a wholesale massacre of all the other dogs on that account. The majority of people are, however, quite callous and ignorant as regards the ways of wild creatures, and do not take the trouble to ascertain whether many of them are not among their best friends ; it is easier, and more in accordance with accepted custom, to kill them all at sight.

All the harriers, the bâteleur, as well as the larger eagles, are great snake eaters, and they, like owls of all kinds, do tremendous work among the swarming rats and mice. Even if some of them do take toll from the game and smaller birds, it is not nearly so great as that levied by the snakes and rats which they destroy, since both the latter are dire foes to both eggs and nestling birds.

In fact, man ought to be very careful how he interferes with the balance of Nature lest he find himself in the end a sufferer by his own act. Here is an extract from the year-book of the United States Department of Agriculture, which deserves attention :

" The sooner farmers, ranchmen, horticulturists, and nurserymen learn that the great majority of the birds of prey are their friends, and deserve protection, and that only four or five species are injurious, the sooner will the depredations by noxious rodents and insects diminish.

" In the more thickly settled portions of the country, except at rare intervals, the goshawk, the duck-hawk, and the great horned owl are so infrequent that years may pass without an individual being seen. . . . The

important fact to bear in mind is that all hawks and owls feed largely on noxious rodents and larger insects, such as grasshoppers, crickets, and beetles, and from their size and voracious appetites are important factors in reducing the numbers of these pests, and keeping them under control.

"There is a number of species of birds and mammals, which although they do not strictly belong to the predaceous groups, are nevertheless extensively predatory in habit. Among the better known of these may be mentioned rats, squirrels, ravens, crows, jays, herons, and gulls. With the exception of the house cat, the rat probably kills more young chickens than any other animal. In some places where this rodent has become well entrenched owners have found it impossible profitably to raise chickens. Rats have been known to kill newly born lambs and pigs, and they frequently destroy the young and eggs of wild birds. This is especially true in suburban districts and on islands along the coast. It is well known that members of the heron family feed to a great extent on fish and on other forms of aquatic life, and consequently do not live far from water.

"Two species, however, the great blue heron and the bittern, depart at times from the family traits, and visit hillsides, cultivated fields, and drier meadows in search of ground squirrels and field mice which they greedily devour. The herons, like other flesh-eating birds, digest their food rapidly, and are disposed to gorge themselves when opportunity offers. It is fair to assume that at a low average, a pair of herons with four or five young will consume a dozen or fifteen gophers daily. The gulls and terns that live inland do effective service by checking the inroads of injurious insects and mammals.

Ravens, crows, and jays do effective work in destroying pests. Occasionally, however, when they have increased out of proportion to the food supply available, they become troublesome by killing small chickens and by destroying the eggs and nestlings of wild birds."

From the same source I quote an incident showing the results of interfering with the balance of Nature.

"An extensive marsh bordering a lake in northern New York formed the suitable home for numerous ducks, rails, snapping turtles, frogs, and other aquatic life. The turtles deposited their eggs in abundance in the sand of the old beach. These delicacies attracted the attention of the skunks of the neighbourhood, and their nightly feasts so reduced the total output of eggs that only a small proportion of the young survived to reach the protective shelter of the marsh. As time went on conditions changed. Skunk fur became fashionable, and commanded a good price. The country boy, ever on the alert for an opportunity to add to his pocket money, sallied forth and captured the luckless fur-bearer wherever found, so that within a comparatively short time the skunks almost wholly disappeared. When this check on their increase had been removed, the snapping turtles hatched in great numbers and scrambled off in all directions into the marsh. When their numbers had been properly controlled by the destruction of a large proportion of their eggs, their food supply was adequate, but when they increased many-fold the supply proved insufficient. Finally, through force of circumstances, the turtles added ducklings to their fare until the few ducks that refused to leave the marsh paid the penalty of their persistency by rarely bringing to maturity more than one or two young. It is not surprising that this great aggregation of turtles, containing the essential of delicious

soup, should have attracted the attention of the agents of the market-men and restaurant keepers.

"The final chapter—the readjustment of conditions—may be briefly told: the marsh became a scene of great activity, where men and boys caught the voracious chelonians, and bags, boxes and barrels of them were shipped away. There was also a depreciation in the value of skunk skins, with a corresponding loss of interest on the part of the trappers; so the progeny of the surviving skunks congregated at the old beach and devoured the eggs of the turtles that had enjoyed a brief period of prosperity. The broods of ducks now remained unmolested and attracted other breeding birds, with the result that the old marsh reverted to its original populous condition."

In the above case man did accidentally readjust the conditions, but, of course, this is not often the case.

The true eagles, and the nearly allied hawk eagles, consist of the Black Eagle, the Tawny Eagle, the Martial Hawk Eagle, the Crowned Hawk Eagle, the African Hawk Eagle, the Booted Eagle, the Brown Eagle, and the Crested Hawk Eagle. All these birds are feathered down to the toes.

The martial hawk eagle is one of the handsomest as well as the largest of the tribe found in Africa. Its range includes the greater part of the Ethiopian region, and though nowhere actually common, in any country well stocked with its natural prey, one or a pair of these grand birds may be often seen sailing high in the air, its white breast gleaming in the sun.

They prey on game birds of all kinds, hares, lambs and kids, duikers and steenbucks, and the newly born young of larger antelopes if found unprotected, besides iguanas, snakes, and tortoises. I shot one which was

eating a large iguana, and I put another up from the newly killed body of a big puff adder. Their method of attacking snakes is that of other large birds of prey, including the secretary bird : the reptile is held firmly by the talons and torn by the beak, while the wing is used as a shield against the poison fangs. Small carnivora, up to the size of a half-grown serval, are also attacked much in the same way as other mammals of similar size.

If the animal is too big to seize and carry off summarily, the eagle swoops down, imbeds his talons firmly in its back, flaps his wings in its eyes, and pierces the back of its skull with his beak. I have seen them stoop at both guinea-fowls and francolins on the wing ; but, as a rule, they capture their prey on the ground, watching its movements from the shelter of a neighbouring tree, and then pouncing on it with a sudden rush. At Sabi Bridge the fowls suffered severely for a long time from the depredations of two of these birds. They would return again and again at irregular intervals for a fresh victim, and so wary and alert were they that it was for a long time impossible to get a shot at either of them. I have seen one sweep from his ambush among the dense foliage of a fig tree on the other side of the river, three hundred yards away, straight as an arrow upon some unsuspecting fowl, light on the ground close by it, and then capture it with a shuffling run, instantly flying off again to safety, its prey clutched tightly in its talons.

When brought wounded to the ground the martial eagle fights fiercely for its life, and is extraordinarily quick in striking with its talons, which it uses much as a cat does her claws. I remember bringing one down with a rifle bullet from the top of a pretty high tree.

It fell heavily with a broken wing; but on several "boys," accompanied by a greyhound, running to the spot, it threw itself on its back, gave the dog a wound in the throat with its beak, which narrowly missed the large artery, and placed her *hors de combat* for the time being, while one of the natives who followed barely escaped a lightning stroke from the claws which would certainly have laid bare the bone of his leg.

The nest is built in a tree, of rough sticks, and one or two eggs are said to be laid in a clutch.

The wing measurements of an average bird taken just after death, were sixty-nine inches from tip to tip, and the weight ten pounds six ounces.

The tawny eagle is of a mottled brown colour above, and tawny chestnut beneath, with yellow legs. It is a relatively short-tailed bird, and so has a rather "stumpy" appearance. It is very fond of hilly country, and is often found in the neighbourhood of isolated rocky outcrops. It attacks all game birds and small mammals up to the size of lambs. Unlike the martial eagle, which, when able to do so, likes to carry its prey off to a tree to devour, the tawny eagle seems generally to prefer making its meal on the ground. It probably destroys a large number of snakes, and I have several times noticed individuals in the act of killing these reptiles. Now and then no doubt the eagle is worsted in such encounters. Ranger de Laporte reported having found one, which, from its appearance, had obviously met its death from a snake's fangs. I think all the larger birds of prey do their part in snake killing and are amongst the most dangerous enemies of these reptiles.

There are two species of harrier eagles in South Africa, the Black-Breasted Harrier Eagle, and the Banded Harriet Eagle; both are large and powerful birds, the

legs feathered less than half-way down, and they live principally on frogs and reptiles. I found a night adder and a young cobra in the stomach of one of the former.

The Bâteleur Eagle is more akin, both in appearance and habits, to the buzzards than to the eagles. It is widely distributed in Africa, and is a bird easily recognized on the wing by its very short tail and its manner of flight, which consists in sailing along, with first one wing, and then the other, elevated. The full-grown bird is glossy black below, and rich chestnut above, while the legs are coral red.

Contrary to the generally accepted idea, I do not believe that the bâteleur attacks either live mammals or birds. Its food seems to consist of reptiles and carrion. I have often noticed it coming down to kills with the vultures, and it frequently gets there before them, and picks the eyes from the carcase. Ranger de Laporte observed one driving away several vultures ; on going to the spot he found a five-foot python with both its eyes picked out, presumably the work of the bâteleur. I kept one at Sabi Bridge for several months ; it became quite tame, and ate any carrion given to it greedily. In the same large cage were confined a number of small birds, and during the whole time the bâteleur never attempted to do them any harm, nor did they display any fear of it. When, however, as occasionally happened, one or other of them died from natural causes, it lost no time in eating the body. I found also that while a live rat was disregarded, a dead one was taken immediately. Of course, the actions of any creature in captivity are not always criteria of what it will do when in a wild state ; but, at all events, it is safe to say that though many bâteleurs come sailing over my station, not one has ever attempted to touch the fowls, nor have

I ever noticed them shepherding guinea-fowl or francolins in the manner of the truly predatory birds.

One of the best known of the kites is the Yellow-Billed Kite. These birds are partially migratory, arriving in south Africa during September, and being seldom seen after the middle of March. However, they go no farther north than Moçambique, where I have seen them in great numbers in July, and they were very numerous at all the up-country Portuguese posts as far as Lake Nyasa in August. They are great carrion eaters, and also destroy large numbers of locusts and other insects. They have the reputation of being confirmed foes of young chickens, though I have not personally known any of the large numbers present around Sabi Bridge about the end of each year to sin in this respect. I believe it to be a vice acquired by individuals, through familiarity with man and his surroundings, and that the killing of warm-blooded animals is not really natural to the birds. Major Fraser says: "After seven years of innocent life, the yellow-billed kites started on my chickens; I shot two with chicks in their claws; none have erred since, and so I take it that pair learned evil ways elsewhere." They have a way of suddenly swooping down, just grazing the ground, to carry off any piece of meat or offal that may be lying thereon, and are always extremely bold and careless of man's presence. In November and December they are numerous along the Sabi. Through January and February they are less and less seen, and have entirely disappeared by the end of March. I have seen pairs nesting in December near the Sabi. The nests are large rough structures of sticks, and are made in high trees.

The Black-Shouldered Kite is a handsome little bird, easily distinguished by its habit of remaining poised in

MARABOU STORK

A PAIR OF FISH EAGLES

the air with flapping wings. It lives principally on small reptiles and insects.

The Sea Eagle frequents all the permanent rivers and lakes of the Ethiopian region where fish are plentiful, and its piercing cry is the constant indication of its presence. It is a very handsome bird, of black, white, and rich brown plumage. It perches on trees overlooking the water, watching ceaselessly for some unwary fish to approach the surface. Its victim perceived, the sea eagle darts downwards with a swift rush, and, its body just lightly grazing the water, into which its talons are inserted, it grasps its prey and bears it off in triumph to devour, amid raucous cries of triumph, in the high branches of some bare tree. The nests are very large, and are built usually in fairly inaccessible trees. Two eggs are laid in a clutch.

The Lämmergeyer is the southern form of the genus, the other being an inhabitant of southern Europe and northern India. It extends through most of the mountain ranges of the Ethiopian region, and, though a killer of live animals, belongs to the vulture, rather than the eagle tribe. It is of very large size, spanning over five feet across the wings. Its food consists mainly of carrion and bones, but it also attacks lambs, the newly born of wild animals and sickly sheep.

The Secretary Bird has had a good deal of romance written round it on account of its snake-eating proclivities. As a matter of fact, it attacks snakes and other reptiles no more and no less than the other large birds of prey, and does as much harm to the young of game birds and hares. It is generally seen stalking solemnly along in pairs or singly, on the look-out for food, and when disturbed it makes off at a fast run, the long legs covering the ground at a great pace ; the wings are stretched out,

but are seldom used for flight, and then only for a short distance. When resting, the secretary bird likes to lie on the ground with its long legs stretched out to one side of it.

Other birds of prey include, in south Africa, five species of harriers and a rather rare harrier hawk, six goshawks, two buzzard eagles, five sparrow hawks, three buzzards, two perns, five falcons, two hobbies, six kestrels, osprey, lanner, and vulturine sea eagle.

## CHAPTER V

### BIRDS OF PREY : VULTURES

SEVEN species of vultures are indigenous to South Africa, and the majority are, either themselves, or in closely allied forms, spread over most of the Ethiopian region. Probably there is no other bird whose appearance on the wing and on the ground offers more vivid contrast. Sailing majestically far up in the blue, without perceptible movement of its great pinions, it seems to cleave the air free of all conscious effort and conveys to the earth-dweller far below the ideal of poetic motion. When seen on mother earth it is hard to realize that this ungainly, clumsily hopping, and repellent-looking bird, is the same that so delighted our senses when on the wing ; nor is the picture in any sense restored, as, disturbed at its feast, it flaps heavily away to some adjacent tree.

The habits of these birds have formed the theme of frequent description. They remain on the roost later in the mornings than others of their feathered kin, and though the falcon tribe are usually not early on the wing, the vultures are still more tardy in setting about their day's work. When the sun has fully dispelled the morning mists, and

the air becomes clear, they leave the leafless bough which has been their night lodging and circle far up, until, from being a mere speck in the sky, they are finally lost to the view of the naked eye altogether. They are solitary in their watch for food, and each bird floats about quartering his own patch of the heavens, until his amazingly keen sight indicates to him the presence of a dead animal, when he sweeps straight down in a long inclined plane. Seeing him drop, his nearest companions on right and left follow suit, and the signal is taken up until every vulture for many miles around is gathered to the feast.

The old theory that vultures hunted by scent, which found a staunch supporter in an eminent naturalist of the middle of the past century, has been discredited by later observation, and it is now universally held that it is their keen sight alone which tells them the whereabouts of their food. I think no one who has seen vultures drop in scores from extreme altitudes within a few minutes of an animal having been killed, can doubt this for a moment. After two occasions on which I had happened to shoot crocodiles basking on sandbanks, stone dead with the first shot, so that they lay in perfectly natural positions, I took the trouble to visit the carcasses every day, in order to see what the vultures did On one occasion it was a week, and on the other five days, before any birds came near; though as many minutes would barely have elapsed in the case of a mammal lying obviously dead in the bush ere they put in an appearance. A dead animal well covered up with branches is also quite safe from vultures; and the leopard, in placing his kill up a tree, probably has these birds, as well as four-footed scavengers, in mind.

It is doubtful how far, if at all, any birds are served

by their sense of smell. I have again and again noticed that francolins and knorhaan will feed quite close up to leeward of a man so long as he remains quite still; and in stalking guinea-fowl it is quite unnecessary to bother about the direction of the wind, provided they neither hear nor see you. Though the gathering of vultures is nearly always the sure indication of a dead animal, the number assembling is no guide to the size of the carcass. I have seen at least fifty follow a leader down to a half-consumed hare or snake, while there is no doubt that even their acute vision is sometimes deceived, as was evident fom a number of them being attracted by a red blanket lying on the ground near one of my camps.

Should the carnivore responsible for the act be lying up by and guarding his kill, the vultures will be noticed sitting thickly on the trees around, gazing fixedly in the direction of the carcass; but they generally flap away on the approach of a human being, thus giving the alarm. When engaged at a carcass, they fight amongst themselves and make a good deal of noise. It is astonishing with what rapidity they can consume even quite a large beast, and of a creature of the size of a dog nothing is left in a few minutes except the bigger bones, the lesser ones being swallowed whole. They will eat any carrion, except the remains of one of their own species, and though they must often have to spend long periods fasting, they make up for their enforced abstinence by the voracity of their appetites when the opportunity arrives to satisfy them.

Vultures seem to hang permanently about the vicinity of some of the large villages of central Africa, roosting on the trees close by at night and spending the day hopping and waddling about among the garbage heaps,

thus leading a luxurious and untroubled existence. I kept a tame one of the common southern species for some months. It was quite peaceable and well disposed to the dogs, fowls, and other animals which came near its perch, to which it was tethered by a light leg chain, and was quite docile and apparently contented in captivity from the first. It was originally caught through its own greed, being found with its head so firmly fixed in a carcass that it could not withdraw it.

The Griffon Vulture is the common "aasvogel" of south Africa, and is, in the sub-continent, by far the commonest of the family. It is there found at kills mixed with, but in much greater numbers than, the other species. It constructs a large rough nest in a high tree or rocky kranz, and in the eastern Transvaal I have seen pairs building in February. One egg only appears to be laid.

The White-Headed Vulture. These birds are not uncommon in the eastern Transvaal, and they have been on several occasions accidentally caught in traps or shot by guns set over kills. I have seen them at carcasses in company with the griffon.

The Black Vulture is easily recognized by its dark colour, large size, and red head and neck. It is seldom seen otherwise than singly, or at most two or three together. Whether perching on trees or feeding at carcasses, these birds always seem to keep apart from other vultures, and they are very much more difficult to get near than most species.

Ruppell's Vulture and the White-Backed Vulture are smaller species than the above.

The Egyptian Vulture is nowhere numerous in the eastern Transvaal, though it becomes rather more so towards the north. I have generally noticed it singly

or in pairs. North of the Zambezi it is very much more often seen. It is easily to be distinguished from the surrounding vultures of other species by its slender head and beak and the lanceolate * feathers on the back of the head and neck.

The Hooded Vulture. This bird has a head and beak shaped like the last ; but there are no long feathers on the back of the former, which is of a dark flesh colour. It is of relatively small size.

## CHAPTER VI

### BIRDS OF PREY : OWLS

THERE are thirteen species of owls described from south of the Zambezi. It will be sufficient here to mention one or two of the larger types. The majority prey on insects, such as scorpions and locusts, also on small lizards, rats, and mice. Some, such as the little Scops Owls, appear to be insectivorous only.

The Giant Eagle Owl is much the largest of the tribe. It is of dark brownish-grey colour mottled with white, and has prominent ear tufts. It is distributed through most of the Ethiopian region. It is, like the other members of its family, strictly nocturnal, sleeping in the daytime amid the foliage of some leafy tree, usually crouching, its breast supported on a branch, in preference to perching in an upright position. At night it sallies forth to attack birds from the size of guinea-fowls, and mammals from the size of hares downwards. It is a confirmed robber of the poultry yard, and will force its way night after night into badly constructed fowl-houses until it has cleared out the roost.

* Shaped like the head of a lance or spear.

It makes a peculiar clucking sound when angry, much resembling the cracking of a hard nut, which it repeats many times. By night it utters a deep hoot, but has also another cry, which I have heard it make in the early morning from its tree ; this is a very shrill and penetrating whistle or screech, which can be heard a long way off.

I once found a young bird, nearly full grown, but still unable to fly, hidden away in the fork of a large tree about eight feet from the ground. About dusk its mother arrived, and I brought her down with a charge of shot apparently dead. She was carried into camp by the legs, and thrown into a corner to be skinned in the morning. When morning came she had disappeared, and after a long search was discovered under a bush about fifty yards away. She was still to all appearance dead, and during the march that day was carried in a basket on a " boy's " back, quite limp and motionless. That night she again disappeared and was found under the same conditions as before. I now began to suspect that she was not quite so severely injured as I had believed, and could in fact discover no damage except to one of the wings. The following night some raw meat left beside her had vanished, and two days after arrival at my station she abandoned her artifice, ate everything that was given to her, and, like her offspring, soon became very tame. Both these birds have been in the Zoological Gardens at Pretoria for the last four years. I never knew an animal sham dead longer and more naturally.

As a set-off to the damage which they do to small game, there is no doubt that these owls also eat considerable numbers of locusts and other insects and reptiles, including snakes. A large one will measure some three feet across the wings, and their bodies are broad and bulky.

*Sabi Game Reserve, Photo*

SECRETARY BIRDS

The bird on the extreme right is lying down with legs stretched out

The Spotted Eagle Owl is another large owl, though less in size than the last. It is very much mottled with dark brown, yellow, and white, and has prominent ear tufts. It is spread through most of Africa south of the Equator. It preys on small mammals—such as rats and mice—reptiles, and insects. I have never known this species to attack domestic poultry.

Many African tribes are intensely superstitious about owls, and the birds calling near the villages, or perching on the huts at night, are believed to presage disaster. Crossed sticks are occasionally placed on the apex of a hut to ward off the threatened evil.

## CHAPTER VII

### MISCELLANEOUS BIRDS—I

THE present work cannot aspire to give any description or account of the habits of any but a very few of the species which make up the swarming bird life of south Africa. Some idea of their numbers may be formed by a glance at the appendix. I propose therefore to touch on a few only of the larger, brighter plumaged, or otherwise more noticeable types, recommending for any real study of the subject, one or other of the many volumes specially directed to it.

In addition to the various sea birds, the game birds, and the birds of prey, there are more than half a dozen other orders of birds existing. Much the largest of these contains the "perching birds"; in fact, this order comprises about half the existing number of species, including of course nearly all the small types with which we are familiar.

Nearly all, or at least a great majority, of the perching

birds are more or less insect-eaters, and as such ought to be rigidly protected as being helpers of the farmer in keeping down the various scourges which attack his grain and fruit. Many birds, which themselves do a great deal of damage in this way, more than make up for it by eating vast numbers of insects which would prove far more destructive than the birds, were the latter not present to keep them in check. Birds possess voracious appetites, and get through a truly astonishing amount of food for their size. It does not take a small bird long to consume more than his own weight in insects. In fact if we had no feathered friends, it is difficult to know how we should keep our insect enemies, with their swarming grubs, in check at all.

The trade in the feathers of those birds, which, unluckily for themselves, have brilliant plumage, has already done a vast amount of harm all over the world. Man has suffered a good deal for his own folly, and would suffer still more but that he has at last awakened to the danger ; and so the plumage trade is now everywhere being regulated, and in some countries even abolished. It also happens that many of the birds which wear the most attractive plumage are among the worst enemies of the insects.

Dr. Hornaday, the well-known director of the New York Zoological Park, has probably done more than any other man to show up the iniquity of the total destruction of wild life, particularly of bird life, and during the past few years his efforts have been crowned with conspicuous success, especially in the United States. His book, " Our Vanishing Wild Life," should be read by every one who desires to gain some idea of the dangers which threaten to exterminate wild life nearly all over the world at the present time.

In the second chapter he writes as follows :

" For educated, civilized man to exterminate a valuable wild species of living things is a crime. It is a crime against his own children and posterity.

" No man has a right, either moral or legal, to destroy or squander an inheritance of his children that he holds for them in trust. And man, the wasteful and greedy spendthrift that he is, has not created even the humblest of the species of birds, mammals and fishes that adorn and enrich the earth. ' The earth is THE LORD'S and the fullness thereof ! ' With all his wisdom, man has not placed here so much as a ground squirrel, a sparrow, or a clam. . . . . The wild things of the earth are *not* ours to do with as we please. They have been given us in trust, and we must account for them to the generations which will come after us and audit our accounts.

" But man, the shameless destroyer of Nature's gifts, blithely and persistently destroys one species after another. Fully 10 per cent. of the human race consists of people who will lie, steal, throw rubbish in parks, and destroy forests and wild life whenever and wherever they can do so without being stopped by a policeman and a club. These are hard words, but they are absolutely true. From 10 per cent. (or more) of the human race, the high moral instinct which is honest without compulsion *is absent.* The things that seemingly decent citizens—men posing as gentlemen—will do to wild game when they secure great chances of slaughter, are appalling. I could fill a book with cases in point.

" To-day the women of England, Europe and elsewhere are directly promoting the extermination of scores of beautiful species of wild birds by the persistence with which they buy and wear feather ornaments made of

their plumage. They are just as mean and cruel as the truck driver who drives a horse with a sore shoulder and beats him in the street. But they do it ! and appeals to them to do otherwise they laugh to scorn, saying ' I will wear what is fashionable when I please and where I please ! ' "

Dr. Hornaday elsewhere in the same book quotes the well-known bird tragedy of Laysan Island in the Pacific Ocean. This is an isolated little island only two miles long by a mile and half wide ; but until 1909 it was absolutely teeming with all kinds of beautiful sea birds. In 1909 an expedition was organized to exterminate all these birds and send their feathers to Japan for sale and export. The organizer of this raid was a European. For some months he and his companions were uninterrupted, and managed to tear off the wings of some *three hundred thousand* birds, before a United States gunboat arrived and put a stop to their energies. As a result the island was almost stripped of bird life, and the neighbouring coasts of the mainland missed their usual annual migrants which used the island as a nesting-place.

The birds mentioned above were mainly albatrosses, terns, petrels, shearwaters, boobies, and man-of-war birds. In other parts of the world a savage warfare is waged against many beautiful and useful song birds merely for the sake of their feathers.

The various species of white egrets supply the plumes known as " aigrettes " or " ospreys," and are therefore hunted down and destroyed in vast numbers, though they are harmless as well as beautiful birds.

From nearly all the rest of the feather trade, the ostrich industry stands out as a bright exception. In the former, the birds required are merely killed off wholesale to supply the demand, without anything being done

artificially to replace the numbers destroyed. In the latter, the ostriches are farmed and treated just like other valuable domestic animals. Their plumes are carefully clipped at the proper season with no discomfort whatever to the bird, and the old stumps afterwards fall, or are eased out. The ordinary process of moulting is in fact merely assisted. Had ostrich farming not been taken up half a century or so ago, there is no doubt that ostriches would long ago have ceased to exist in South Africa, and thus a great and profitable industry would not have existed at the present day. Perhaps in the future the farming of other plumage birds may be adopted on similar successful and humane lines, and thus both trade and birds may benefit. At present it is very like a case of " killing the goose that lays the golden eggs " or of a man who, living on his capital, will wake up one morning to find his last penny is gone.

THE CROWNED LAPWING, sometimes called the " screaming plover " and familiarly known in South Africa as *Kiewitje*, is a familiar figure almost everywhere in the veld. Though sometimes shot, it can hardly be classed as a game bird. It is about the size of an ordinary plover with black and white plumage, and associates either in pairs or in small flocks, according to the season of the year. It is an extremely noisy bird, and is possessed of a spirit of permanent unrest, which prompts it to fly about uttering its loud and grating cry, often by night as well as by day.

To the hunter the crowned lapwing is often a very great nuisance. Should he be trying to approach game quietly, a couple of these birds will very likely get up close in front of him and fly away with loud cries of warning and alarm ; but they will not, like well-regulated birds, then depart and leave him alone. On the con-

trary, they will go straight ahead for fifty or one hundred yards, alight, and repeat the manœuvre as soon as the hunter again comes up to them. This sort of thing may go on indefinitely, and needless to say every wild animal within sight or hearing has its head up, looking and listening to learn what the trouble is about. Apart from their unmelodious call, and their lack of sympathy with the sportsman, they are deserving birds, and great destroyers of grasshoppers and other insects.

THE SNAKE BIRD. This curious and solitary bird may occasionally be seen by the margins of African rivers, lakes, and pools, into the waters of which it dives in pursuit of the fish which form its food. It has a curiously long and flexible neck, which it can twist in all directions, and which has conferred on it its English name. When swimming, the head and neck alone protrude above the surface and look at a distance exactly like a snake as they undulate backwards and forwards with every stroke. The bird can remain about five minutes under water, and on emerging, often many yards away from where it dived in, will stand motionless on the bank, or on a rock, with wings spread out to dry, for half an hour or more. I once watched one standing on the edge of a rock about six inches above the surface of a deep pool. A fairly large crocodile was floating about lazily near by. Most of the time the snake bird seemed entirely immersed in his own thoughts, but when the crocodile happened to come quite close—within two or three feet—he would utter a couple of hoarse " quacks " and twist his neck round towards the reptile, though without shifting his feet an inch. This went on for over an hour. It was one of those cases which tend to indicate that wild creatures know quite well when their natural enemies are not to be feared.

THE CROWNED CRANE is always a striking-looking bird, with its slaty plumage, and its curious patch of straw-coloured bristles on the head. The wattles on the face seem to vary in colour in the different local races in Africa; those of the southern species are white, bounded with bright red above.

THE GREEN IBIS. Popularly known as the "hadada," this bird is found throughout the greater part of the Ethiopian region. It frequents the vicinity of rivers, and in the early morning and late afternoon its loud and harsh cry, which its name not inaptly describes, is a familiar sound, as in pairs or small flocks up to a dozen or twenty in number the birds wing their way to and from their feeding-grounds. They fly pretty high, rather heavily, but at a pace which is deceptive. I have always found them extremely wary birds, which, when resting in trees, seldom permit near approach, and usually alter the course of their flight the instant they catch sight of anything suspicious. Moreover, their course is usually directed straight up or down the middle of the stream, and they appear to leave it only at the point nearest to their favourite feeding-ground. Their food consists almost exclusively of insects, which they seek in every kind of country, but in swampy land for choice. The flesh is of dark colour and excellent eating.

## CHAPTER VIII

### MISCELLANEOUS BIRDS—II

THE MARABOU STORK. This large and rather repulsive-looking bird, with its almost naked pink head and neck, huge and powerful beak, and scavenging habits, is nevertheless possessed of the most beautifully soft,

GRIFFIN VULTURE

VULTURES AND MARABOUS ON A TREE

snow-white, downy feathers on its under tail covers. It is common all over tropical Africa, but is much less frequently met with south of the Zambezi. In parts of east Africa, I have seen large flocks feeding about much like white storks, and they will eat insects, fish, and any small mammals or birds that are too young to escape them. They are generally among the first to arrive at kills, and may be seen sitting around on the trees mixed up with the vultures, with which they can more than hold their own. In the ponds in the Transvaal Zoological Gardens, they appear to tyrannize absolutely over the herons and other large water birds, which often display considerable fear of them as they stalk solemnly round making occasional vicious prods at any not quick enough in clearing a path.

THE SADDLE BILL. This very large stork is rather rare in south Africa, but I have once or twice noticed pairs on the Sabi, about February, stalking about in the shallows and on sand-banks. One old gentleman used to come regularly to a certain pool every morning about seven, and remain till twelve. During the whole of the five hours, with only occasional short rests, he quartered the whole shallow extent of muddy water systematically, dabbing his bill in at every step. As he only caught a small frog or some such creature about once in twenty minutes, he had to work hard for his livelihood. Now and then a female joined him, but she was much less patient and would fly away after an hour or two. The fore part of the Saddle Bill's beak is crimson, the centre black, and the saddle or shield which comes just above the nostrils bright yellow.

THE WHITE-BELLIED STORK. This is an African bird, though it only visits the south during the warm summer months.

THE BLACK STORK is also a summer visitor to South Africa, but certainly in individual cases remains in the south all the year round, as I have several times noticed them in the Transvaal low country during the winter months, always in pairs, and one was shot on the Olifants River early in July, All storks, especially the well-known European migrant, follow the locust swarms in great numbers, and, in common with kites, starlings, and many others, levy an enormous toll.

THE HAMMERHEAD. Most residents in Africa are familiar with this queer, stolid-looking bird, with its crested head and plain brown plumage. Although measuring but little over twenty inches in length, it yet builds a nest which might well be worthy of the largest bird that flies. Mr. Haagner, in his "Sketches of South African Bird Life," thus describes it: "It consists of sticks and mud: first a saucer-shaped foundation, about three feet in diameter, is built of large sticks thrown together and cemented with mud. Upon this foundation a circular dome-shaped structure is erected, containing a round chamber (sometimes two); it is a solid structure, with a round entrance hole just large enough to admit the bird. The top is often decorated with old tins, rags, bits of plank, and we have even found dead birds, and old bits of skin. It may measure four feet by three and a half, and is sufficiently strong to bear easily the weight of a heavy man." These nests are, of course, more or less permanent structures, constantly used by the same pair of birds.

HERONS. There are fifteen species of herons and bitterns described from south Africa; amongst them, and extending through most of Africa, is the splendid Goliath Heron, which is the largest of its tribe in the world.

EGRETS. These birds, of which four species are found in south Africa, belong to the same family as the herons; they are all distinguished by their snowy white plumage and carry, when in "full dress," long ornamental plumes on their heads and shoulders. Three of the species haunt pools and marshes, feeding on frogs, small fishes, and shell fish, wading about and catching their prey in shallow water. The fourth kind is known as the cattle egret, and is found all over south Africa. It is the constant companion, either in pairs or in small flocks, of the herds of cattle, and relieves the beasts of the ticks which infest them. The cattle egret is therefore rightly classed among the most useful of the local birds, and is protected by law.

PIGEONS. The fruit, or as they are usually termed green pigeons, are brightly clad in green and yellow plumage, with their legs and part of their bills of a bright red colour. They are usually seen through the open forest country in small flocks, and fly swiftly from tree to tree when disturbed. They feed on wild berries and fruits.

DOVES. These pretty and confiding little birds exist in many species all over Africa. In the south much the most common is the Cape Turtle Dove, which swarms about the poultry yards and old gardens picking up grain, and shortly before sundown may be seen flighting in immense numbers, and at a great pace, to and from the water.

The little Namaqua Dove appears to be a winter migrant to the eastern Transvaal low country. At any rate, during two summers, when I was specially on the alert for it, it did not put in an appearance at Sabi Bridge at all, though plenty were to be seen by May. In 1911 I saw one pair in December. In Portuguese Nyasaland

in August it was not met with until an altitude of 1800 feet was attained, at about 300 miles from the coast. It was then numerous.

PARROTS. There are in south Africa four kinds of parrots, and three kinds of parakeets or love-birds. The parrot found in the eastern Transvaal is the brown headed type. It carries bright green and yellow plumage, and is of small size (only some nine inches long). These birds go about in moderate flocks and are very swift fliers. On the wing they utter noisy and harsh screams; they are very handsome little birds, but sadly destructive to crops of grain, and are nearly always to be noticed somewhere in the neighbourhood of native villages.

THE GREY LOURIE. In south-central Africa between latitudes 15° and 25° there is no more familiar bush sound than the long-drawn "Go away" of the grey lourie.

I did not notice it in Portuguese Nyasaland, but in Angola, at about the same latitude, it is quite common. It is a bird of short flight and rather lethargic habits. During the warm hours of the day, it sits, usually alone, in some well canopied tree, at intervals uttering its distinctive and rather querulous call. At certain seasons of the year, grey louries seem to collect in small companies, and are then very noisy. The crest is alternately raised and depressed while the bird is calling. It is popularly supposed to warn the game of the hunter's presence and there is no doubt that animals become disturbed when they hear it; but it will sit for hours saying "Go away" at frequent intervals, whether human beings are near or not, and I do not believe the cry to be invariably a signal of alarm. The flesh is quite good eating, what there is of it. Another familiar bush sound is the note of the Coucals or bush Cuckoos, of which there

are several species. This is a frequently repeated "Coo-coo-coo, coo, coo, coo," gradually dying away into a minor key. These birds are non-parasitic in their nesting habits.

THE HONEY-GUIDES are among the most interesting birds in Africa. Their habits of guiding the ratel, as well as human beings, to bees' nests was first described by Sparrman in the early part of the last century; but so remarkable is the reasoning power displayed in all their actions, as described by writers who have observed them since that time, that even at the present day many newcomers to Africa remain incredulous until they have witnessed the performance for themselves. I have always been as much impressed by the bird's wonderful pertinacity as by its intelligence. It not only asks, but insists, that you shall follow it, and will pursue you doggedly for miles in the opposite direction from that in which it desires you to go, uttering an incessant grating twittering. Although when following it to a nest natives always whistle and croon to it—a custom perhaps originally imitated from the ratel—I have seldom noticed it to require encouragement, and its disappointment and anger are perfectly obvious should you turn and go off in another direction.

When trying to get up to game, the attendance of a honey-guide is one of the most annoying things imaginable; all animals, whether ungulate or carnivorous, appear instantly to recognize that its call is indicative of human presence and at once become on the alert. On such occasions, stones hurled at it appear for the moment, but not permanently, to discourage it; it no doubt feels that, given a few minutes to reflect, you are certain to repent of your folly in trying to drive it away, and so decides to give you another chance. It is inter-

esting to speculate how these curious customs of bird, and beast, and man, may have found their origin in the dim recesses of the past.

The various species of honey-guides are parasitic in that they, like the cuckoo, deposit their eggs in the nests by built other birds. The fledgelings are provided with

*Sabi Game Reserve. Photo*

GROUND HORNBILL

hooks on their mandibles, which they perhaps use to turn the young of their foster-parents out of their nursery.

Sitting quietly in the bush you will seldom fail to hear the "tap, tap" of the woodpecker, as he hops at all angles up and down the trunk of some insect-infested tree. Entirely an insect-eater, he is consequently a deadly foe to that form of life. A very tame one used to make a habit of visiting my veranda for the purpose of picking

the borers and grubs out of the old wood of the poles. We possess about a dozen different kinds of woodpeckers in south Africa.

The bright plumaged Rollers are always most conspicuous birds in the African bush. They are bold and confiding, and great consumers of locusts, grasshoppers, caterpillars, and other insects. The handsomest is the Lilac-Breasted Roller, with its bright blue wing covers, and gyrating flight. The European Roller is a summer migrant to south Africa, and is during that season extremely numerous in the eastern Transvaal, occasionally nesting there.

The Ground Hornbill. These big birds, with their black and white plumage, scarlet wattles, and huge bills, are nearly always met with sooner or later by the traveller, feeding in open patches in the forest, in flocks of from six to about twenty, during the cool hours of the day. Their deep and melodious call of "hoo—hoo, hoo, hoo—hoo, hoo," always heard when they are in the vicinity, is usually most frequent in the very early morning.* When disturbed they go away with a ponderous flight, often for a considerable distance, though they never rise far from the ground. At the end of their flight they sometimes perch in trees. They will eat almost anything: snakes, tortoises, small mammals, nestling birds, eggs, grubs and caterpillars are all delicacies.

Although not timid birds they are extremely wary. In captivity they become marvellously tame and show extraordinary intelligence, understanding very much as a dog does, what is said to them. I knew a tame one which would lie down shamming dead, jump up again

* The female seems to say, "Dō tăke căre, dō tăke căre;" and the male answers at once, an octave lower, "All-rīght-Mărў."

on its master's word, and by many other indications show that it could grasp his meaning. They are most useful birds in a garden, demolishing all insect pests; but cannot be restrained from immolating little fluffy chickens, which they transfix with their great beaks, toss into the air, and catch neatly in their open mouths. All day they scarcely cease for a moment from uttering a low, monotonous throaty sound, which is quite different from their far-reaching "hoo, hoo."

There are many other hornbills of several genera, all of which live among the trees. In the eastern Transvaal, the commonest is the Yellow-Billed Hornbill, which has a very easily distinguished call of "tocky tock, tocky tocky tock," rather like the sound of bubbling water. The female makes her nest in a hollow tree, the entrance to which is sealed up by the male, which afterwards conveys to her her daily food through a little hole left for that purpose. The nest is lined with feathers from the breast of the hen, which moults while sitting, and disposes thus of her cast plumage.

## CHAPTER IX

### MISCELLANEOUS BIRDS—III

KINGFISHERS. South Africa is rich in kingfishers, of which some ten different kinds are met with. There is one large species—the giant kingfisher—which attains a total length of nearly eighteen inches. Most kingfishers are brightly plumaged and active little birds, fond of sitting on a branch by the water side, and suddenly darting down into the water at any small fishes which imprudently approach the surface: there are several species, however, which seem to live a good

deal away from the water, and are said to prey chiefly on insects.

I think the most fascinating of all to watch at his work is the handsome little "pied kingfisher." This bird, in its neat black and white uniform, may be seen poised perhaps twenty feet or more above some pool, the body held stationary, the wings beating rapidly up and down, while the head and tail are both bent downwards almost at right angles to the body. Suddenly it sees a fish near the surface. At once the wings close, and down goes the bird headlong straight to the spot. A resounding splash, and it is lost to sight, to emerge in a few seconds triumphant, its finny prey wriggling in its beak, or unsuccessful but undaunted. When hovering above the water the position is often changed by a quick dart to one side or the other, and the expectant pose resumed.

A kingfisher may often be noticed sitting on a branch holding his newly caught prey in his beak. If you watch him, you will see him regarding it with reflective air, and then raising his head he will bring the unfortunate victim with a resounding thwack against the branch on which he is sitting. He will repeat this action several times with a pause for consideration between each, and when he concludes that it is sufficiently dead not to make any trouble while on its way down his throat, he proceeds to swallow it whole.

Rollers and other insect-eating birds frequently deal with their prey in the same manner.

THE CARMINE-THROATED BEE-EATER may be mentioned, as it is one of the most brilliantly plumaged birds in south Africa, in its garb of green, crimson, pink, black, and bright blue. Bee-eaters can be recognized by the elongation of the two central tail feathers.

THE LITTLE BEE-EATER is rather sociable in habit.

Small flocks will be noticed perched on twigs or branches, usually by the water side, whence one or other will from time to time dart swiftly on some passing insect, bearing his prey in triumph back to his perch. Though not such conspicuous birds either in size or colouring as their Carmine-throated cousin, the Little Bee-Eaters look very showy in a plumage which contains besides the predominant green, black, yellow, orange, and blue.

NIGHTJARS, as their name implies, are "birds of darkness," and so are more often heard than seen. They may however usually be noticed, just as dusk is merging into night, flitting rapidly about on the hunt for the insects which form their food. Some species spend the day lying flat on the ground, usually among stones and rocks, and so close do they lie, and so nearly do they match the colour of their background, that it is possible nearly to tread upon them before noticing them. When thus disturbed they usually dart away for a few yards and again settle as before. The call is a long chirring or grinding sound.

THE SOUTH AFRICAN HOOPOE is a bird that will generally be seen once or twice in a walk through the bush; you will probably see it perched among the branches of some tree, its conspicuous pale red and black tipped crest alternately spread like an upright fan, and lowered. Its call sounds something like its name.

The remainder of the birds here mentioned all belong to the Order of Perchers.

SWALLOWS. Of these several species are wholly, or partially migrant, while other are resident throughout the year. The Wire-tailed Swallow and the smaller Stripe-breasted Swallow both nest in the eastern Transvaal. The former builds a shallow cup of a nest, constructed of round pellets of mud of about a quarter-inch

diameter, under the eaves of buildings or rocks. A pair were building under the deck-house of a Nyasa steamer in August, and on the boat leaving Fort Johnston—where she had been lying for some time—accompanied her throughout her voyage up the lake and back. Another pair built under the eaves of my bungalow at Sabi Bridge in February. On April 11, the three young ones were just big enough to look over the edge of the nest. On the 21st, one disappeared, and on the following day a second one was able to go for a short flight. The third was taken from the nest by a grass snake on the 23rd. For the next few days the parents were busy teaching their remaining offspring to fly; they all slept in the nest at night, and the young one often returned by itself during the day to rest.

The Smaller Stripe-breasted Swallows build a very neat mud nest with a long funnel as entrance to it, the inside lined with grass and feathers. A pair occupied the same nest for two successive years under my veranda, bringing out three young ones on the first occasion, about the end of February. About the same time the following year (1908) some accident must have befallen the mother bird, since I found three young ones, nearly ready to fly, dead in the nest.

European swallows, which are present in great numbers all the summer at Sabi Bridge, always roost at night in the reeds on islands in the middle of the river, doubtless for greater safety. They congregate at sundown about the cattle pens, where they are accustomed to hawk flies and mosquitoes, and then all together fly off to their night quarters. During a severe storm in April, when both the European and the larger stripe-breasted swallow (an African migrant) were collecting previous to departure, it was noticeable that while the former sought

shelter under the eaves and in the window-ledges of the house, the latter weathered the storm, thickly clustering in the branches of a tree, their backs to the rain.

RAVENS and CROWS. The ravens are represented by the White-Necked Raven in the south, and another and larger kind in the north and the east of the Ethiopian region. The former is not present in the low country of the eastern Transvaal, except as a very occasional visitor; but it exists in considerable numbers in Portuguese Nyasaland both in low-lying forest and in hilly country. It is usually seen singly or in pairs.

THE PIED CROW is found all over the continent of Africa, south of the northern tropic, and swarms round most of the villages of the interior on the look-out for scraps and refuse. Like the raven, it frees both cattle and game from ticks. Although found in the neighbourhood of Barberton, no great distance away, this bird is scarcely ever seen in the low country of the north-east Transvaal, and I think has only twice been noticed near Sabi Bridge in nine years. On the first occasion a single one came and took a small chicken, and on the second a pair were observed. It associates in couples, and probably the large assemblies sometimes seen round tempting feeding-grounds are merely the collection of numbers of such couples.

The African Rook is rather irregularly distributed through Africa. Its habits are not unlike those of the European rook.

THE OX PICKERS. These curious birds live almost entirely on the insect parasites which they pick from the hides of the larger mammals, both wild and tame. They are often known as "rhinoceros birds," from being the constant companions of that pachyderm, which they serve not only by ridding him of ticks, but by

warning him of the approach of danger. They of course do the same for any other animals, and are among the difficulties every bush hunter has to contend with. When alarmed, they generally fly up into the surrounding trees, uttering a continuous husky chatter. I have found that their procedure when with tame animals differs from that adopted when with game, for, seated in rows on the back of an ox, they do not appear to pay the least attention to the approach of a human being, whereas in the bush they will fly off the antelopes or buffalo, when one is still some distance off.

Although they are certainly of benefit to cattle, and make no more impression on their hides than they do on these of the wild ruminants, it is otherwise with donkeys, to which they do as much harm as good. Not content with picking off the ticks, they proceed to enlarge the little abrasion which the insect leaves behind it, until at last a yawning cavity, streaming with blood, is formed. The least gall or chafe on the withers, or elsewhere, is at once attacked and enlarged, the birds appearing to enjoy consuming the living flesh and blood. Not the least remarkable point is that the donkeys habitually take no notice whatever of the birds, however much they suffer, and make not the smallest effort to get rid of them, being in this way quite different from horses, which, will not endure their presence for a moment. Therefore, to keep donkeys in good condition where tick birds abound, requires the most constant watchfulness. In fact, at Sabi Bridge it has always been necessary to employ a small boy, whose sole duty consists in scaring them from the donkeys while at grass.

These starlings can cling to an animal's body at any angle ; on the sides, between the legs, even under the body, and their temporary host, thoroughly under-

NEST OF MASKED WEAVER BIRD

standing what their business is, usually helps them all it can. The birds are able not only to hang on during any movement of the animal, but they can also jump and climb about with marvellous ease. In fact, they can hop forwards, sideways, or backwards with equal readiness,

NEST OF SOCIAL WEAVER FINCH

and to attain a lower level simply let themselves drop straight down, the strongly recurved claws gripping the coat at the desired spot.

The species met with in the Sabi-Olifants district of the north-eastern Transvaal is the Red-Billed, and in my experience it is equally, if not even more addicted to digging holes in donkeys than its yellow-billed cousin.

WEAVER BIRDS. These interesting little birds are closely allied to the finches. Many of the species are very brightly coloured, and most are social in habit, building colonies of cunningly woven nests, which are suspended from reeds or branches.

The Masked Weaver Bird builds every year in great numbers near the Sabi. About October, their neat kidney-shaped nests may be seen swinging in hundreds, and in all stages of construction, from the ends of reeds and willowy branches, while the busy owners, in their handsome yellow and black uniforms, flit to and fro with much cheerful chirping and chattering. They are dreadful little pests to growing grain. If the nests should be destroyed the birds will build new ones and lay again, up to two or three times. The eggs are of several different colours, some pale blue, some spotted, others nearly pure white, and they also vary in size.

The young seem all to be fledged by the beginning of March, and I have known them to leave the nests at least a month earlier.

The Buffalo Weaver bird is a large dark-coloured bird which builds a big rough nest in which several pairs of birds have lodgings of one compartment each. These nests are often built in trees in the midst of a colony of masked weaver birds. The whole community must have rather an anxious time occasionally, as several snakes, notably

coral snakes, frequently seem to take up their quarters in the same tree and live on the nestling birds.

THE SOCIABLE FINCH congregates in flocks up to several hundreds. These flocks construct in common one huge nest divided into numbers of self-contained compartments, one for each family of birds. The nests are added to year by year, and attain the size of large hayricks, besides being very solid and heavy. This species does not seem to be recorded beyond the limits of south Africa.

SUN-BIRDS. The charming little honey suckers rank among the most fascinating of the smaller birds. The plumage of the males is usually brilliant and has a bright metallic gloss which adds to its beauty. As they flit to and fro they may be seen sucking the juices from flowers and plants and dabbing at insects with their long curved bills. Most of the species have bodies only some five inches long.

They are the humming birds of south Africa.

# PART II

# REPTILES

## CHAPTER X

### CROCODILES

THE reptile class includes the crocodiles, turtles, tortoises, lizards, and snakes. The members of the various orders agree generally in the low temperature of their blood, and in the outer layer of skin taking the protective form of bony plates or scales. Reptiles belong to an earlier period of the world's history than either mammals or birds, and, with simpler organs than either, their nervous systems and intelligence are also of a lower grade.

THE EGYPTIAN CROCODILE. This is the common crocodile of tropical Africa. Its range now extends from the upper Nile, through the rivers and lakes of central Africa, to the Tugela in the south-east. It formerly occurred a good deal north and south of these limits ; but at the present day is certainly rare outside of them. It seems never to have existed in the streams draining the south and south-west districts of south Africa outside the tropics. Probably the cool atmosphere of the high southern tableland and of the south coast barred its progress from the east, while the dry countries of the south-west may have offered an impediment upon that side of the continent. It is essentially a lover of tepid tropical waters, and, extended on a sand-bank or rock,

delights to warm its chilly blood under the full blaze of the midday sun. Within its range it exists in practically every large stream, and in nearly every tributary and lake. Sometimes large individuals lie at the bottom of the most insignificant pools, wholly or partially buried in mud, and in such cases their presence would be betrayed only by the spoor on the margin.

The size which crocodiles are ultimately capable of attaining is uncertain. During the first three or four years the rate of growth is fast, perhaps more than a foot a year. As the animal gets older it grows more and more slowly; but when, if ever, it entirely ceases to increase in length and bulk is quite unknown. That they live to a very great age is probable. In most carnivorous animals a limit is put to pursuit of prey, and hence to life itself, by the wearing down of teeth and claws, which occurs long before the failure of bodily strength has rendered the individual unable to earn its livelihood. With the crocodile it is otherwise. Each of his formidable pointed teeth is merely a shell, and under it, when removed, will be found a new tooth, growing up to replace the old one when discarded. There seems no limit to this replacement of teeth; possibly it ceases only when the vital forces have weakened from extreme old age. Where a creature so sluggish and low-graded is concerned, these forces are subject to much less wear and tear than among warm-blooded animals, and therefore the period of bodily activity may be much more prolonged. Still, the size attained by crocodiles is no doubt often exaggerated, and measurements form the only true tests.

An enormous brute which used to haunt a certain pool in the Sabi was stated to be as bulky as a hippo, and, from one or two glimpses I got of him, I judged him to be not less

than eighteen feet long. Eventually I succeeded in shooting and landing him, and the measurements proved him just half an inch under fourteen feet, with a girth of six feet seven inches at the shoulders. The majority of large crocodiles killed and measured in the Game Reserves have averaged about twelve feet over all. In more tropical rivers they may attain a larger size. I shot one in the Lujenda river, and another in the Nile, near the head of Lake Albert, which I believed at the time to be longer and bulkier than any I had ever seen in the south ; but I was unable to recover either, and appearances are proverbially deceptive.

These reptiles are extraordinarily tough and tenacious of life, and, unless killed stone dead, almost invariably manage to slip into the water, when, if not wounded in a vital spot, they probably ultimately recover. Being capable of going for long periods without any food, temporary inability to hunt no doubt inconveniences them in only a minor degree. A shot in the brain is, of course, immediately fatal ; but in a crocodile that organ is of such small dimensions that very accurate marksmanship and some knowledge of anatomy are requisite. It may be, however, the only possible target, as, for instance, when the reptile is floating with merely his head above water. Aim should be taken a little behind the eye, when he is side on ; while, should he be facing you, a bullet just between the two eyes may at least lay bare the brain, and so prove fatal. When a crocodile, lying at full length on land, presents a side shot, it is generally best to fire right at the middle of the shoulder ; this will very likely pierce the heart, and if it does not, it will at least so cripple and paralyse the animal that time will be afforded for a second attempt. I have killed a great many crocodiles in this way which never moved after

having received the bullet. A shot in the lungs, or one which cuts through the valves of the nostrils, or injures the air passages, is also quite deadly; for the animal is then unable to remain under water, and will reappear on the surface within a few seconds. I have known crocodiles wounded in some such way climb right out of the water on to sand-banks they had just vacated, and so offer themselves easy targets.

I remember one, shot in the lungs, make three or four successive rushes to land, dashing back again into the water each time he received a fresh bullet. Another, shot and left for dead on a sand-bank, had disappeared, when, ten minutes later, I returned with some natives to skin him. After a long search we found him about a hundred yards down stream, lying in water some three feet deep. He was unwilling to move, and absolutely refused to show his head above the surface, so, after a consultation the natives volunteered to go in and spear him. At the first thrust he dashed off down stream, through the shallow water, and a most exciting chase ensued. Luckily for us there were no deep pools for some distance, and the natives kept heading him off up stream. He made no attempt to turn upon, or, indeed, to do anything except try to escape from his pursuers. It was marvellous with what speed, in spite of a severe wound from an expanding bullet, he dashed about through the shallows; but eventually he was done to death, and proved to be about eleven feet long. I killed another which had three large spherical bullets embedded in different parts of its body. From the manner in which the tissues had grown up round them, I judged they had been there for a good many years, and there was not the smallest sign of any local disturbance consequent on their presence. There was also in the body a Lee-Metford bullet,

probably fired by myself about five months before. This had entered near the root of the tail—of course, missing the backbone—and had more or less raked the animal, without, seemingly, causing him much inconvenience.

In 1902, a native brought in some half-dozen newly hatched crocodiles. They were only a few inches long, and I kept them for some time in a bucketful of water, feeding them on various insects. Their habits were precisely those of their elders. As they lay floating on the top of the water, a blue-bottle fly would be dropped within an inch of the nose of one of them. For the space of perhaps half an hour the little reptile would lie like a log, apparently quite unconscious of anything at all. Then, without warning, he would make a lightning dart, and the fly would disappear. A little later, I sent them to the Zoo at Pretoria, where they were all reported to have died within a few weeks of arrival, and to have been thrown away on to a rubbish heap. Time passed and the incident was forgotten; but a few years later it was noticed that young waterfowl in one of the large ponds in the gardens occasionally disappeared in a mysterious manner. One morning, when this sort of thing had been going on for a considerable time, a native attendant came rushing up from the place, exclaiming excitedly that "there was a schelm in the water." Investigation subsequently disclosed the presence of a crocodile nearly four feet long, which, without doubt, was one of the youngsters thrown away for dead three years previously.

It is very difficult to catch a crocodile in even the largest gin-trap. I have often set these things over baits close to the water's edge; but the reptile almost always springs the trap without injury to himself, and after-

wards composedly removes the bait. A native snare—the noose made of wire cable, and all the adjuncts formed of very strong material—has sometimes been successful. On a single occasion we succeeded in poisoning a crocodile at Sabi Bridge, but its custom of stowing its prey away until putrid usually causes the poison to be carried by the water.* They are sometimes shot by trap guns ; but I never knew one to be killed outright by this method, and it is difficult to say whether an animal which has escaped into the water is mortally hit or not.

I once loaded an old 10-bore musket with a double charge of powder and a handful of shrapnel bullets, and set it over a dead wild dog placed close to the brink of a deep pool. During the night we heard an explosion as of a small cannon, and in the morning it was found that a large crocodile had set the gun off. The latter had been set very low across the line of approach, with a view to hitting the creature in the shoulder, and, there being no marks of shot among the thick bushes facing the muzzle, it was pretty clear that the charge had gone home at a distance of not much over six inches. In spite of this, the crocodile had been able to slip off the bank into deep water, and no traces of him were ever again seen.

Crocodiles can remain under water for a considerable time at a stretch : I do not believe that it is known for certain how long ; but their powers undoubtedly greatly exceed those of warm-blooded animals in this respect. If suspicious of danger, or for other reasons desirous of escaping detection, they have a way of protruding just the tips of their nostrils, under the shelter of bushes overhanging the bank, taking a fresh breath and at once

* With more experience of this method we have since succeeded in poisoning a great many crocodiles with strychnine.

sinking. It is, under these circumstances, almost impossible to distinguish them. Their bodies float about forty-eight hours after death.*

Through the hot hours of the day crocodiles like to bask in the sun, especially during the winter months, when the water is cold, and the sand-banks and rocks are exposed. In the cool of the afternoon they slip off into the water to seek their prey. Though it is never safe to trust to their habits, they are, generally speaking, most active and dangerous from about two hours before sunset until the same time after sunrise. In the hot weather, when the water is warm, they spend much more time in that element, and its discoloration after rain renders the stalking of prey of all kinds easier. The bad reputation of the lower Pongola in Zululand is due quite as much to its permanently murky nature as to the number of crocodiles present.

Crocodiles are capable of going for long periods without food. The stomachs of many, perhaps of most, when opened, contain only a few handfuls of smooth, worn pebbles, swallowed to assist digestion. All kinds of remarkable things are sometimes found, such as bracelets, rings, teeth and claws of large carnivora, and so on. I once found ten inches of an impala horn, the thin end having been gradually worn away and digested by the action of the powerful gastric juices. The crocodile's tongue is incomplete, the muscle which corresponds to the organ being tied fast throughout to the lower jaw. The food is bolted whole, there being no means for proper mastication, and, no doubt for this reason, is invariably eaten as high as possible. A crocodile at the Transvaal Zoological Gardens refused all fresh meat, and, in fact, ate nothing for over a month ; but as soon as his food

* Earlier in hot weather.

was offered to him in a decomposed condition, he devoured it greedily.

Fish provide the greater proportion of the crocodile's diet, and their scales are found in the opened stomachs more often than animal matter of any other kind. From a high rock overlooking a clear pool in the Zambezi I once watched a crocodile at work. He lay like a log in the water, perfectly rigid and immovable, until his chance came in the near approach of some heedless fish, when one lightning rush placed the prey within his jaws. During the rainy season, when the tributaries are full of water, the fish generally go some way up them to spawn, and subsequently, as they begin to run dry, the small fry come down to the great rivers in thousands.

At the junction of a stream known as the Mutshidaka with the Sabi there is a sand bar, beyond which the water of the latter river is rather deep. I once, during the month of March, watched two crocodiles, a large and a small one, reaping a rich harvest at this point. The shallows of the Mutshidaka, above the sand bar, were swarming with little fish of all kinds, mostly only a few inches long, which were continually being carried down into the Sabi. The crocodiles lay with their bodies in the deep water, and their lower jaws resting on the sand-bar in about six inches of water. Their mouths were wide open, and as the shoals swam backwards and forwards they were sucked in wholesale. Every now and then the larger reptile, which, of course, occupied the best place, would make a dash at its companion, and drive it a little farther away ; while the latter after retiring for a time, would gradually begin to edge up again towards the special preserve. The lower jaws of crocodiles, unlike those of mammals, are stationary, and it is the upper ones which move up and down. It is thus that their

owners are enabled to lie quite flat upon rocks or sand by the water's edge, with their mouths wide open.

In addition to fish, mammals of all descriptions and sizes when in or at the edge of the water are liable to be seized. A favourite method of the crocodile is to lie immersed close to a drinking-place either at the brink of the main stream, or of some adjoining pool. Scent, sight, and hearing are all very acute: the moment anything is heard approaching, two eyes, barely showing above the surface, are cautiously protruded. They quietly disappear, and their owner, completely concealed, floats a little nearer. Arrived within striking distance, he waits until his intended victim's head is lowered to drink, when, with a swift rush, he seizes the nose or leg. Having once got their hold, the formidable jaws never relax. However desperately the victim struggles, the advantage which the crocodile derives from the purchase of his feet against the bottom, and his long and powerful tail, is seldom to be disputed successfully, and the water quickly closes over the tragedy. Since the reptile chooses his own ground, the combat must, in the nature of things, always be an unequal one, and though some very large and powerful mammal might conceivably be able to pull a small or medium-sized crocodile out of the water, it is doubtful if it would ultimately escape from the bulldog grip and cold-blooded tenacity of its enemy.

## CHAPTER XI

### ADVENTURES WITH CROCODILES

Of course, the crocodile only attacks such animals as it considers itself able to overcome, relative to its and their individual size. Probably the only two species

which are quite immune are the hippopotamus and the elephant. The rhinoceros might, perhaps, have been considered large enough to escape attack; but in "African Nature Notes" Mr. Selous relates how one was pulled down and drowned by crocodiles in the Tana, an incident actually witnessed by an American sportsman, Mr. Fleischmann, who was able to take photographs of the incident. Should an animal be on the bank, close to, but not actually in the water, it may be overbalanced and knocked in by a deft blow from the crocodile's tail. I have known both white men and natives to have very narrow escapes in this way, and it is, in fact, never safe to stand less than three feet from the water if there is any likelihood of a crocodile's presence and you are unattended. This is specially applicable to fishing in deep and discoloured pools.

Having drowned his victim, the crocodile next proceeds to dispose of it. Having a deep-rooted objection to fresh meat, he selects some convenient ledge or cavity below water-level, where his food may be stowed until sufficiently ripe to satisfy his taste. The banks of most African rivers are undercut by the current in many places, thereby providing convenient storehouses, at or near the entrance to which the saurian mounts guard. A story has been related of a native who, having been seized by a crocodile and half drowned, returned to consciousness, to find himself in a cavern under the bank, but just above the water-line. Immediately above his head the earth had fallen in, and there was a hole through which daylight was visible. Collecting all his energies, he sprang for this, and scrambling out safely, though in dire fear of pursuit, arrived at his village, somewhat the worse for the adventure. Here he found further difficulties confronting him, his relatives

running away and refusing to believe that he was not a ghost !

Terrible as are the jaws of the crocodile, he does not use them to mangle and tear in pieces live prey, but only to hold it fast ; therefore the less the resistance offered the less is the resulting injury from the teeth. I have often found antelopes drowned under the river bank, apparently quite uninjured, until examination brought to light the tell-tale punctures about the nose. The wounds made by a crocodile's teeth are not poisonous, and animals which have been bitten and managed to get free soon recover.

A little boy, fetching water from a pool on the Sabi, was seized and pulled in. The men of the village turned out, and, wading waist deep in the water along the edge of the bordering reeds, felt with their spears until the body was discovered pushed into a crevice of the bank ; it was very little bitten. In face of several persons together, especially if they are making a noise, a crocodile will usually, though not always, sheer off.

The number of natives who, throughout Africa, annually fall victims to these sinister brutes must be enormous. Within even the small area which comes within my own personal knowledge two or three cases occurred every summer, before the majority of the big crocodiles had been killed off by the rangers. There is a drift on the Usutu River in Swaziland, which used to be haunted by one or more very dangerous crocodiles. During the late South African War a number of men belonging to an irregular corps stationed in the vicinity were accustomed to bathe at the spot, and one young fellow was given to amuse himself when in the water by alarming his companions with a sudden shout of " Look out—croc ! " One day this man was sitting on a rock,

*Sabi Game Reserve, Photo*

AFRICAN CROCODILE

dangling his toes in the water, when he suddenly screamed out "Croc's got me!" and disappeared. Thinking that it was but a repetition of the well-worn jest, the others merely laughed at what they thought was an unusually realistic piece of acting, when, to their horror, they caught sight of his arm protruding from the water some way down stream. With great promptness and pluck, two men sprang in, swam to the spot, and actually succeeded in bringing their companion ashore out of the very jaws of the monster, which was, perhaps, scared away by shots fired from the bank. The man was already dead, however.

Not long afterwards, two native messengers had occasion to cross at the same point, the stream being in partial flood, and the water more than waist deep. Both had rifles, and it was agreed that they should cross separately, each, from the bank, covering, with his rifle, the other as he crossed. The first had not got half-way over when he was pulled under, and the precautions taken proved vain, for his friend's rifle spoke to no purpose.

A rather pathetic case occurred years ago on the Zambezi. A number of native women were washing clothes, when one of them was seized by a crocodile, which, swimming to a small sandspit, some oneh undred yards from the bank, landed her there, fainting, but alive. The other women, though they talked excitedly, made no attempt to run for help, or take any other active step. As it happened, a young half-caste Portuguese came along at the moment, and, grasping the situation, at once jumped into a canoe, and paddled to where the woman was lying. He had actually covered more than half the distance, when the watchful brute, concealed in the water close by, seized its prey again and disappeared with her for the last time.

No doubt the dispositions of crocodiles vary much in different rivers and lakes, and the seizing of men and other large mammals appears largely a matter of acquired habit. At Shesheke, on the Zambezi, a paramount chief, who lived some forty years ago, used to derive great amusement from watching slaves and criminals being thrown to the crocodiles, his chair being brought to the river's bank in the cool of the afternoon that he might enjoy the spectacle in comfort. The crocodiles at this place never forgot those halcyon days, and, until very recently, it was almost certain death for any one to drink at the river, or attempt to draw water, except within one of the protecting screens of logs which were erected for the purpose. Strange natives, unwarned of the danger, were constantly falling victims, as were dogs and other domestic animals. I believe that of late years shooting by white men has greatly reduced the number of crocodiles, and therefore the danger. On the other hand, there are some large pans in Amatongaland, which, although full of the reptiles, are said to be quite safe to bathe in, attacks on human beings being unknown.

Notwithstanding that there are few large villages, situate on the banks of the greater African rivers, whereof at least one member of the community does not bear on his person some sign of a hairbreadth escape from the jaws of a crocodile, it is remarkable how callous natives are in regard to danger from this source. They usually exhibit a much livelier fear of lions, though the actual toll taken by these animals must be the merest fraction of that levied by crocodiles. It may be due to a certain lack of imaginative faculty; the principle that a peril which can neither be seen nor heard must be less pressing than one of which the senses give notice. Whatever the reason, it is undoubtedly most difficult to prevent

one's own followers from taking risks in infested streams, and a kind of fatalism seems to render them incapable of learning caution from the loss of a companion, except perhaps for a time, and at the particular place.

One morning I was standing on the banks of the Lujenda River in Portuguese East Africa, watching, with my friend Mr. Maugham, our stores crossing. We had just come to the conclusion that what we had fancied was the protruding nose of a crocodile, was, in fact, only a piece of rock, when a local native who was standing near said, " If you will come with me to the village I can show you a big crocodile." Mr. Maugham electing to stay and superintend the porters cross the river, I went alone with the " boy." The village in question lay but some 300 yards distant and proved to be of considerable size, and full of people, who, at the moment, were in a state of pleasurable and noisy excitement over the arrival of our large caravan. " But surely there can be no crocodile here, with all that noise going on," I remarked. " Oh yes," nonchalantly replied the guide, " he lives here, and does not mind the people." Sure enough, on reaching the bank, the first thing I saw was a huge crocodile basking at full length, and with his mouth wide open, on a rock not more than twenty yards away. He was not in the least disturbed by the chattering of the women and children, and there was no question of stalking him. It was only necessary to sit leisurely down on the bank and put a bullet through his shoulder, when, after shutting and opening his mouth a few times, he fell off the rock and sank like a stone. The headman was quite pleased, saying that the animal took some one, usually a woman or child, at least once a month. " Why, then," I said in astonishment, having noticed that about every second man seemed to be provided with a firearm

of some sort, "did you not shoot it?" "Ah well, we have very little powder, and it is very expensive, and we are poor and require all we have to kill game," was the surprising, though characteristic answer. It is sometimes difficult for a European even to begin to understand the workings of the African mind.

Although a large crocodile, having found a suitable pool well stocked with fish, often remains therein, if not permanently, at least for a considerable period, nevertheless during the rainy season especially, much changing of quarters goes on, and the fact that a pool has been untenanted through one dry season is no criterion that it will be so at the beginning of the following one. When a large crocodile is killed in a pool which he has kept as his own special preserve, it is seldom long before another one, of perhaps slightly smaller size, arrives to take his place. During a heavy flood of the Sabi, I saw a large crocodile being carried down in mid stream at the rate of some five miles an hour. His tail serving him as a rudder, he was keeping his head straight down stream, and making no effort to steer towards the bank. It looked as if he was taking advantage of the flood to effect an easy change of residence.

By night these reptiles often travel great distances overland, but daylight invariably finds them safe in their natural element. At a distance from the latter they are timid, and make for it on the first alarm. I have heard but one reliable story of any disposition to aggressiveness when far away from water, and this may have been due to fear rather than ferocity. A white man was walking along a footpath by night, preceded by a native boy of some twelve years old, when in the darkness the latter stumbled over a crocodile which was apparently moving along the path in the opposite direction. It

immediately seized the boy by the leg ; but on the white man, who was not carrying a gun, beating it with a stick, it let go and made off. When quite close to a river or pool, however, much greater confidence is displayed. I have heard of a native, sleeping on a hot night in the doorway of a hut close to the river, being attacked and dragged in. Healy was riding along the bank of the Sabi one afternoon, when his dog chased a monkey into the reeds ; a moment later there was a yelp followed by a splash, and that was the last he heard of his companion, which probably had run into a crocodile lying close to the water's edge.

It is certain that when lions happened to have killed anything on the bank, a large crocodile will sometimes come ashore at night and take it away from them. Such a one came out of the water and drove away five lions from the carcass of a waterbuck they had killed on the banks of the Olifants River. The lions had apparently given way without showing any fight at all, merely running about and probably growling while the crocodile dragged the carcass into the water. Well protected above by his scaly armour, he is vulnerable to teeth and claws, however powerful, underneath only, while as an offensive weapon his flail-like tail forms a useful adjunct to his terrible jaws. I have heard one reliable instance of a crocodile having been killed in such an encounter with lions, but several of the latter were said to have been responsible. Of course, when caught actually at the water's edge a lion stands no more chance than any other animal.

Though always cunning and suspicious, the crocodile at times evinces considerable audacity in the pursuit of his prey. Natives are occasionally knocked off the gunwales of their canoes by a flick from the tail, or a blow from the

snout against the side. I recollect Major Gibbons standing upright in the stern of our little aluminium steam launch on the Zambezi, with the tiller between his feet, nearly losing his balance through an attack of the latter kind. One day I disturbed a crocodile which had been basking on a slab of rock by the side of a pool. He of course immediately dived, and my two terriers coming up proceeded to drink at the spot, which was about three yards on the left of where I was standing. Presently to my surprise, I saw the crocodile returning. He was plainly visible in the clear water, floating gently about a foot below the surface, and making straight for the dogs. When about equidistant from myself and them, he cautiously raised his head, no doubt to measure his distance, and without anticipating the bullet which ended his career. Although he must have seen me plainly, this animal did not take the slightest notice of my presence.

Crocodiles are as partial to dogs in Africa as they are said to be elsewhere ; and in the Game Reserves we have lost many faithful friends through these brutes during the past eight or nine years. They are generally taken when in the act of drinking, but not infrequently also when swimming across either on their own account or following their masters. The least taint of blood in the water seems to attract crocodiles instantly, and antelopes, which, pursued by wild dogs, reach the river after having been injured, are nearly certain to escape one danger only to fall into another.

Crocodiles are characterized by a strong musky smell, which often betrays their present or late vicinity. I was once standing on a stone in the middle of the Sabi fishing. Close by was a deep pool ; but the water was clear, and since two large crocodiles had been successively shot in

it, it had apparently remained tenantless. By and by, however, I became conscious that there was a very strong smell of musk in the air, and, though unable to see anything the least suspicious looking, I did not quite like the situation, and made the best of my way to the bank. Next day I shot a ten-foot crocodile on the stone on which I had stood, and no doubt he must have vacated it on my arrival the day before, leaving his strong odour clinging to it.

Females crocodiles lay clutches of several dozen eggs once a year, so far as is known. The eggs are about the size of a goose's, white in colour, and equal at both ends. I have found various numbers, from twenty to fifty, in one nest. They are buried in the sand somewhere close to the water's edge, and the sun's rays are made responsible for the hatching. The depth at which they are buried is variable, occasionally as much as eighteen inches, but ordinarily a good deal less. Eggs have generally been found from the beginning of November up to about the middle of December in the eastern Transvaal. Any laid later would run considerable risk of being washed away by the floods which occur in the early part of the year.

The female is usually not far away while the eggs are hatching; but once the young are in the water it is probable that she takes no further notice of them, unless it be as articles of diet. No doubt the youngsters on first being launched upon life find the world a hard one. Not only are birds of prey, tiger fish, and otters on the look out for them, but they must also go in considerable dread of the larger members of their own species. It is doubtful if more than one per cent. of each hatching survives to an age when they can not only defy their enemies, but prey upon most of them in turn.

When angry, crocodiles hiss like most other reptiles. At other times they utter a low throaty noise, which is seldom heard unless a night has to be spent close to some of their favourite haunts, such as the reed-bordered and swampy margin of some great lake or river.

## CHAPTER XII

### LIZARDS AND TORTOISES

THERE are two large lizards found in south Africa. These are popularly described as "iguanas," though the true iguanas are almost all confined to the new world.

The larger of the two, known locally as the water iguana, is found in reeds and rocks close to the water's edge and, when disturbed, always seeks refuge in that element. Though a strong swimmer and diver, it is much less aquatic in habit than the crocodile, and apparently leaves dry land only to seek safety or food. I have seen skins of these lizards which measured, when dry and shrivelled, over six feet long, but in the low country of the Transvaal it is very seldom that individuals measuring more than four feet are met with. The tail is very long and tapering, and the body colours black, yellow, and dark green. The teeth are slightly recurved, not very long, but solid and sharp. The tongue is forked.

When alarmed, the water iguana rushes swftly towards the stream or pool, which is always close by, crashes through the reeds and leaps into the water with a resounding splash. It is thus often mistaken for a young crocodile. Its food consists of fish, frogs, crabs, eggs, and the young of birds and small mammals. It is not a climber in the true sense of the word, but can scramble up sloping trunks in pursuit of prey. It is a dangerous

enemy to the poultry yard, stealing the eggs and carrying off the young chickens. I have never personally seen a case of a full-grown fowl being taken, but I have no doubt that a large iguana could accomplish this feat without much difficulty. Its raids take place equally by day and night, and extend to a distance of several hundred yards from the water.

In 1906 I lost the greater part of a clutch of twelve small chickens, which were carried off one by one in the course of a couple of days. On a hot afternoon I was sitting in my bungalow, when a great cackling arose from the veranda where a hen was tending some chicks. Rushing out, I saw an iguana about three feet long in the act of making off with one of them in its mouth, and ignoring the hen which was fluttering about in great excitement and pecking at the intruder. My fox terrier, which accompanied me, disposed of the latter with a few vigorous shakes, meeting with no resistance whatever.

These reptiles lay eggs, which are buried in the ground or sand, but at a considerably greater depth than is usual with those of a crocodile. I have seen quite little ones about the end of October, in the eastern Transvaal. To its credit must be placed the fact that this lizard eats the eggs of crocodiles and of snakes as readily as it does those of birds.

The tree iguana is very much smaller than the last type. Individuals encountered in the Sabi Bush rarely reach three feet in length. The body colours are fainter than those of the former species, and the tail is short and thick in comparison with that of the latter. The teeth, though no doubt adequate for procuring the natural food of the animal, are of practically no account for purposes of defence. This lizard is found in forest and

A TREE LIZARD

*Sabi Game Reserve, Photo*

bush, and among rocks, often far from water. When alarmed, it either takes refuge in a tree, or in some hole or cranny of the rocks. It is a very nimble climber, but its pace on the ground is slow—a kind of shuffling run. Though when brought to bay it makes a great demonstration, hissing loudly and darting its long forked tongue in and out of its widely opened mouth, while saliva flows freely from its jaws, it seems to have no real capacity for resistance. None of the many I have seen killed by dogs made any attempt either to bite or to spit. I have heard natives say that the saliva is poisonous, but never noticed anything to confirm this.

The tree iguana lives on insects of various kinds, birds' and snakes' eggs, the young of the former, possibly the newly born of some of the small mammals, and carrion. I caught one in a cage trap baited with a dead mouse which, however, he had not eaten. He subsequently refused all food while in captivity for a long time. These lizards attack young chickens nearly, if not quite, as determinedly as their cousins of the last described species, and fowls act in the presence of both much as they do when threatened by a snake.

Besides the large types mentioned above, South Africa contains a large number of different types of small lizards, and chameleons. Many of these lizards are beautifully coloured and marked, and they are of all sizes, from only a few inches, to over a foot in length. Lizards feed mainly on flies and other insects, and do a great deal of good. It should be borne in mind that *all* known south African lizards are *perfectly harmless* to man, and they should never be wantonly killed. It is extraordinary, however, with what suspicion many tribes of east coast natives regard them. Nothing will shake their conviction that one and all can and will bite,

and I have often been warned, almost implored, not to handle even the innocent chameleon !

The latter little creature, with its big goggle eyes, which seem to move on pivots, is quite the domestic animal. Put it on the leaves of a good big plant where plenty of flies come to settle, and it seldom displays much ambition to change its quarters. It merely adapts its colour to its background, and sits still. Perhaps presently a fly settles near by, but just out of reach. First one of the big goggle eyes swings slowly round and focusses on the insect. After a pause for consideration, the chameleon takes one very slow and cautious step in the direction of its destined prey. Another pause, and then with a lightning swiftness quite out of keeping with what we have previously noted about the animal, out and back darts the long sticky tongue ; the fly has simply vanished. The chameleon slowly and contentedly champs his jaws for a moment or two, and then resumes his expectant pose. Patience personified.

TORTOISES. South Africa possesses several species of tortoises, of which the leopard tortoise is the largest, attaining a maximum length of between two and three feet. It is relished by many tribes as food. This is a land species. There are two water types. One of these is able to close up the front openings of its shell when head and limbs have been drawn in. The water tortoises have a disagreeable odour, and are less edible than the land types. In the heat of the day they may be seen swimming about in the pools, their snake-like heads occasionally appearing above the surface for air. They reach a length of about twenty inches.

## CHAPTER XIII

### SNAKES : THE PYTHON

THERE are some ninety species of snakes known in Africa south of the Zambezi, of which about twenty-five are poisonous. Many of the forms are, of course, identical with, or only slightly variant from those found in other parts of the continent.

Snakes are all alike in having no eyelids, the place of the latter being taken by a transparent scale, on the same principle as a watch-glass ; and they all change their skins periodically, in full-grown specimens, generally about once a year. They will habitually eat only prey which they have killed themselves.

There does not seem to be much foundation for the popular belief regarding snakes " fascinating " their prey before striking it. I have seen a number of birds fluttering about and screaming close to a mamba, cobra, or other snake in a tree. On these occasions the birds were, however, undoubtedly trying to frighten it away. In their excitement on such occasions—and birds are very excitable animals—one or another dashes in a bit too close and suffers accordingly. In a confined space a solitary unfortunate bird, feeling he cannot get away, flutters and darts about in front of the snake with the terror of despair. I do not think he is any more " fascinated " than he would be by a cat or a weasel under the same conditions.

As regards rats and other small four-legged creatures, they really do not seem to show any great fear of snakes while the latter keep quiet. A cane rat used to sleep habitually on the top of a big python I had confined

with him in a cage, and this went on for over a month, in fact until I sent the snake away.

Rats are known often to gnaw at and sometimes kill sluggish snakes with which they are shut up, the latter sleeping on, and apparently allowing themselves to be worried without taking any notice.

While not precisely hibernating in the strict sense of the term, snakes are so susceptible to cold that, during the winter months in south Africa, they remain almost entirely under ground. A hot day may, however, tempt them abroad, and therefore, no matter what the time of year, it is always advisable to keep a sharp look-out when walking through thick grass or bushwood. Snakes crawl by alternate movements of the ribs, the heads of which are, as it were, hinged to the sections of the back-bone ; therefore, on a perfectly smooth surface, such as glass, they are helpless, while a prickly exterior, as that of cocoanut matting, hurts the lower extremities of the ribs and so is avoided.

Some species of snakes are egg-laying, while others bring forth their young alive. The senses of hearing, smell, and sight are, in most species, very well developed. They eat mammals, birds, frogs, lizards, and eggs, and, in the reduction of the swarming numbers of small rodents, are of considerable service to the agriculturist.

Although the greater number of species are non-venomous, it is too much to expect the ordinary layman to be able to discriminate. Therefore, except in the case of such easily distinguishable forms as the blind burrowing snakes, which look rather like overgrown worms, most people will consider it always more expedient to be on the safe side.

When in camp, the precaution of shaking out the bedclothes before retiring for the night, and in the

morning turning over, previous to donning, the boots and clothes is a wise one. A puff adder as a bedfellow is an unpleasant companion. Mosquito curtains, always useful, have the additional value of keeping off such intruders. Snakes have the strongest possible objection to the smell of disinfectants, and nicotine is fatal to them. One drop of tobacco oil on the tongue will kill any ordinary sized snake. A rope soaked in carbolic and laid round the tent will always obviate the risk of a midnight visit. This objection of snakes to cross a bar of some substance objectionable to them is well known among the native "doctors." The fowl-house at Sabi Bridge had suffered severely from the nightly depredations of a cobra which always managed to elude capture, and which it was impossible to keep out of the rough shelter of reeds and grass. My wagon driver, who happened to be qualifying at the time as a "doctor," volunteered to stop the marauder, and, other means failing, I enjoined him to do his best. He then, with considerable ceremony, proceeded to draw a little trench round the fowl-house, in which he scattered some acrid smelling powder, produced from one of the numerous cartridge cases and antelope horns which he kept about his person. He next pronounced a sort of blessing over his work, and, turning to me with a bland smile, stated that the trouble would not recur. Although at the time I secretly ridiculed the whole thing, it is a fact that the snake thenceforth ceased its visits.

The poison of venomous snakes is secreted in glands on each side of the head. When the reptile strikes, the hinged fangs, which normally lie back horizontally along the inside of the jaw, are protruded forward, and the impact on the bitten substance sets to work certain muscles which drive the poison from the glands down a groove or

hollow in the tooth into the wound which the latter has made. Clothes are therefore some protection ; for even should the fangs penetrate the flesh, a part of the poison may have been ejected at the first contact. On the other hand, at each bite a dangerous snake expels many times the amount of venom needful to his purpose. Leggings and strong boots are effective protections, except against such reptiles as, from their larger size, are able to strike at a higher level. A snake as a rule is able to strike about half the length of his own body above the ground.

PYTHONS. The python is found in most tropical and sub-tropical countries of Africa, and the south African grows to a large size and bulk. The biggest I ever saw killed was eighteen feet long : but I believe that they reach as much as twenty-two feet. The girth of one of the latter length would be nearly that of a man's thigh.

Pythons are non-venomous, and their jaws are furnished with a large number of solid and sharply recurved teeth, which give them a most tenacious grip upon anything they have seized. A pair of horny points occur, one on each side at the lower end of the body, indicating that the remote ancestors of this snake were possessed of legs.

Pythons usually rest underground, making use of old ant-bear and porcupine holes for the purpose. Sometimes they lie coiled up asleep in thick bush or among long grass; and I once unwittingly took my midday siesta, pending the arrival of my transport, within three feet of a large one which was employed in the same manner as myself. They are most active during the cool morning and evening hours ; but they will catch their prey at all times of the day and night. Their favourite method is to lie concealed close to a game path, or stretched along the overhanging bough of a tree, whence they drop on to their prey as it passes below. They are very fond of

water, and spend hours completely immersed, the head or nostrils only just showing above the surface. Small animals coming to drink are frequently thus seized, dragged ashore, and swallowed. Should the water be a little discoloured, it is almost impossible to distinguish the snake when concealed in this manner.

I have met pythons moving across the open in the middle of the day, their huge length dragged laboriously along at the rate of not more than a mile an hour, which seems to be about the utmost they are capable of. To see them thus is, however, rather exceptional, for they have many enemies among the large birds of prey, and so, as far as possible, keep under cover. I once walked up to one which was slowly moving along. When I got within a couple of yards or so, he raised and drew back his head, hissing loudly, but made no attempt to lunge at me. On my wounding him with a rook rifle, the bullet somehow missing the backbone, he merely lowered his head and moved on at the same slow pace as before.

The python lies perfectly motionless in his ambush until some unsuspecting mammal or bird of suitable size comes along, when, making a swift lunge, he seizes it, if a quadruped, usually by one of the legs or the nose. In a twinkling of an eye he has it enveloped in his coils, and then, still retaining the grip of his fangs, he proceeds to crush it slowly to death by muscular constriction. Should the animal be a fairly large one, a purchase is obtained by wreathing the tail round a tree trunk a branch, even a tuft of grass. This aid is not necessary with small creatures, and a turkey cock, which fell a victim in broad daylight at Sabi Bridge, was found wrapped in the python's coils in a corner of the yard where no hold for the tail was possible.

The process of killing takes some time. Wolhuter heard a duiker scream in a bush a little distance away ; it took him nearly ten minutes to find the animal, which was in the grip of a twelve-foot python. After the latter had been disposed of, the buck was discovered to be still alive and without a single bone broken, though so severely crushed otherwise that it had to be killed. Wolhuter considered that it would have taken another ten minutes at least completely to squeeze the life out of it. Some of my natives rescued a young duiker which a python had just seized, and brought it to me. It was much bruised, and unable to walk for some days, but with a little attention completely recovered, and is now the mother of an increasing family at the Transvaal Zoological Gardens.

Having crushed the life from its victim, the snake next proceeds to swallow it, head first. The body has previously been manipulated into an elongated roll, the limbs protruding straight fore and aft. In the course of being swallowed it becomes covered with the saliva which drips freely from the reptile's jaws and materially assists the operation, but there seems to be no ground for the old belief that the snake deliberately licks its prey all over.

Duikers and other buck are swallowed horns and all; the latter, like the bones, being ultimately dissolved by gastric action. A python is now and then found lying torpid, the horns of a buck protruding through the skin without apparently any inconvenience being felt. No doubt after a time they would drop off, and the puncture close up. The digestion of a large animal takes some time, and during the process the snake is helpless, and consequently at the mercy of any enemy that may find him. It consequently endeavours either

to get underground, or to discover some secure and hidden retreat in the bush.

Personally, I never knew a python to seize anything larger than a half-grown bushbuck, and that would, I should imagine, be about the limit of a twelve-foot serpent's capabilities. Natives say that a very large one can swallow an impala, but I must say I never heard of such a thing occurring in the Game Reserve, where they have seldom been found to have eaten anything exceeding in size a duiker or a steenbuck. Therefore, I think that instances of these snakes attacking full-grown human beings must be very exceptional indeed, and nothing of the kind has ever occurred within my experience. Of course, South Africa has its share of snake stories and of vivid narrators thereof, but they should all be accepted with a certain amount of caution. Pythons, in fact, retreat, like other wild creatures, before man, nor does the capture alive of even the largest specimens involve any risk or much difficulty.

The python's life is made up of a series of alternate heavy gorges and inconceivably long fasts. It is said that they can fast without inconvenience for at least eighteen months. I have myself kept large ones which, for over three months, refused all food without apparent discomfort. During nearly the whole of its period of captivity, one of them remained all day immersed in a large kaffir cooking-pot filled with water. Mr. Sanderson captured one of fourteen feet in length out of a pool in the year 1904, and, having put it in a sack, entrusted the latter to a native to carry home. The "boy" became alarmed, and, after a time, threw his burden away, when the python, still enveloped in the covering, managed to wriggle down an ant-bear hole. Thence it was recaptured next day, and was placed inside a wire-

netting enclosure where several fowls were running. In this partial confinement it remained for several months, I forget how many ; but during the whole period it made no attempt to touch the fowls or any other food, though its stomach was to all appearance empty when it was caught.

When the python is free, and in warm weather, its meals are perhaps more frequent. My quarters at Sabi Bridge being infested with rats, I was accustomed to maintain a small colony of cats for their repression. From time to time, over a period of five years, kittens kept disappearing in a mysterious manner, at first at long intervals, but later more frequently ; until at last almost every litter born during the warm weather vanished as soon as the individuals composing it were big enough to move about by themselves. In the cold weather, inexplicable as it then seemed, there were few or no losses. One morning I missed the whole of a few weeks' old litter. After a long search all the kittens except one were discovered hidden under stones and amongst bushes at some distance from the house, and, from the conduct of the mother cat, it was obvious that she had placed them there for safety, for so soon as they were brought back she proceeded to remove them again.

Up to that time I had rather suspected native theft, for, to some tribes, cat meat is a far from despicable dish. Birds of prey were also put out of court, for the mother would not have removed her offspring from the safety of a veranda into the open to escape these enemies. A week or two later the old cat herself disappeared, and finally the big "tom," the oldest inhabitant of the station, failed to answer his name. Soon after this, Healy, coming on to the veranda at dawn one morning, found a seven-foot python coiled up in a chair, and

seemingly quite at home. Seizing a sack which happened to be at hand, and assisted by my cook Ali, he held it temptingly open in front of the reptile, which immediately slid quietly down into the fancied safety of the dark cavity. From this time forth no more cats were lost, and there can be no doubt that this python, with its mate, which was caught in the act of raiding the poultry yard, had for years been growing and waxing fat chiefly on a diet of domestic cats. The blockhouse and veranda which the latter chiefly affected were built on an embankment faced with rough boulders, overlooking the river—an ideal python hiding-place.

I once took fifty-five eggs from a sixteen-foot female python. In size they resemble those of a hen, but have a leathery skin in place of a shell. They are laid in holes, and the female is said to coil herself round them until they are hatched.

## CHAPTER XIV

### SOME HARMLESS SNAKES

THE EGG-EATING SNAKE is distributed over most of South Africa. The type found in the Sabi is from two to three feet long, and has large squarish dark brown spots on its back, with darker bars on the sides of the body; the ground work of the rest of the body is very pale brown. This species is quite harmless, its teeth being practically non-existent, but it has in its throat a mechanism for breaking the shell of the egg which it is swallowing whole, so that the contents slide down easily into the stomach. This snake has a superficial resemblance to the night adder, though it is much more slender and longer proportionately, and is frequently killed in mistake for it.

There are several kinds of water snakes, one brown and four green. The brown type found in the Sabi is olive colour above and pinkish white below. These snakes are generally found in and about pools of water, but I have seen them in my compound, where they no doubt came to hunt frogs. The teeth are very small and solid, and the length of the snake is about two feet when full grown. Natives are very frightened of them, but they are quite harmless.

Another type of snake which inspires great terror in the native mind, and is generally supposed by white men to be very dangerous, is the FILE SNAKE. These are quite big reptiles, sometimes running to five feet long. They have a three-cornered file-like appearance owing to the scales along the middle of the back being raised, making the cut section of the snake appear triangular. They are often found about rubbish heaps, and natives say that they are quite as dangerous as mambas. They are, however, perfectly harmless, having solid teeth and no poison glands.

There are also several kinds of harmless house snakes, which are apt to inspire great terror owing to their habit of hanging about human dwellings on the hunt after rats and mice. They are usually about a couple of feet long, and there are four kinds described from South Africa. The OLIVE BROWN HOUSE SNAKE is of the named colour above, and white below. The spotted species is of a yellowish-brown colour with reddish-brown spots. The STRIPED HOUSE SNAKE is pale brown above with two yellow lines on either side of the head, while the last kind, the BROWN HOUSE SNAKE, is mixed brown and yellow above.

Although no one can be blamed for at once killing any snake he sees, of the nature of which he is not quite certain, however harmless it may really be, it would be

well if people having killed a snake were to examine its jaws, so that next time they come across a similar kind they may know whether it is really dangerous, or whether it is in fact a harmless friend, merely hunting down the mice, like any well-regulated domestic cat. The jaws of the dead reptile having been prised open, it is easy with a pin or a pen nib to examine the nature of the teeth. If the snake carries right in the front of the upper jaw a pair of long slender fangs like small fish bones which lie more or less flat along the jaw, then you may put him down at once as a dangerous creature to be slain at sight.

If there are no fangs in the front part of the jaw, but two or more longish ones towards the back part of it, then the snake is no doubt of the back fanged kind, and may be regarded with justifiable lack of sympathy.

Should, however, the snake be found to possess only a set of little short teeth with no prominent fangs (teeth in fact more or less like those of a small fish) or no discernible teeth at all, it is doubtless perfectly harmless.

Although all snakes are regarded by the vast majority of people with a sort of hereditary aversion, still it should not be forgotten that all of them are great destroyers of small vermin, and the harmless kinds have nothing whatever against them.

## CHAPTER XV

### POISONOUS SNAKES: THE MAMBA—COBRAS

THE poisonous land snakes of Africa mostly belong to two very distinct sub-families, one containing the cobras and mambas and the other the vipers. There are several important differences of bodily structure between

them, and the effect on the victims of the poison of each is dissimilar.

The venom of the first group acts most strongly upon the nervous system, and only in a secondary degree on the blood, which is not clotted or thickened by it. The general symptoms are sleepiness and weakness, followed by vomiting and partial paralysis. The action of the heart is much quickened, and convulsions may or may not precede death. Should the person or beast bitten be lucky enough to survive, recovery is quick and complete.

In the case of viperine poison, the action on the nerves is, at least among the lower animals, secondary to that on the blood. The latter becomes clotted, both the red and the white corpuscles are broken up, the walls of the small blood-vessels become ruptured, and there is bleeding into the surrounding tissues, which causes discoloured patches to appear on the body. Death, if it occurs in the earlier stages, is due to paralysis of the heart and lungs, caused by interference with the circulation of the blood. Should the patient survive these earlier effects, he is liable ultimately to succumb to blood poisoning. The action of viperine poison is slower than that of the cobras and mambas, but recovery seems to take longer, sloughing and other signs of constitutional disturbance sometimes persisting for a year or more after the accident.

The Mamba occurs in forest regions, at low elevations, throughout most of tropical Africa. It is a large and highly venomous snake, attaining, when full grown, to a length of about ten feet. Above, its colour is very dark olive green, verging on slaty black ; the underneath parts are white. The body tapers gracefully, and the head is small. Individuals are sometimes seen in which a bright grass-green colour takes the place of the black, and it has been widely believed in the past that the difference

was specific. This is now contradicted by scientific experts, who hold that other causes are responsible. While some are inclined to believe that the contrast in colour may be due to surroundings, others think that green is the colour of the young snake, and that he darkens with age. The Sabi Bush is notorious for the number of snakes it holds, and there are certainly more mambas to the square mile there than in any other part of Africa with which I am acquainted. They appear to be perfectly constant in colour—*i.e.* olive black—though I saw a green snake, about eight feet long, with the appearance and unmistakable action of a mamba, take refuge in a leafy tree upon one occasion. The bush aforesaid consists of stunted acacias, interspersed with sun-baked outcrops of granite rock, and there are few cool and shady ravines capable of adequately and permanently sheltering any snake from the strong light.

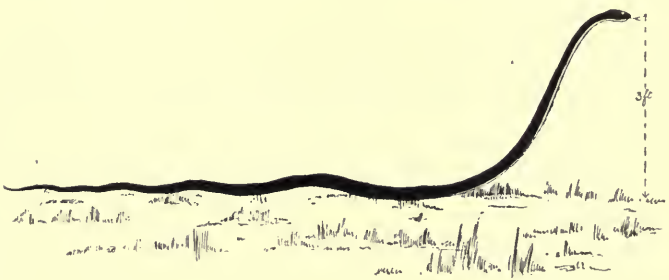
Those who support the theory that surroundings influence colour, point out that the skin of a dead green mamba, if exposed to the sun's rays, quickly becomes dark ; and if this holds good when the snake is still alive, few individuals in the Sabi Bush would have any chance of retaining the lighter hue. On the other hand, I never remember noticing a black mamba under about seven feet long, and I do not think it would be possible to confuse a small one with any other species of snake, the whole appearance and manner of moving are so different. It is conceivable that the young may live entirely in trees until they have attained a considerable size, preying on small birds and their offspring. They would thus largely escape attention, and so their universally green colour would not be noticed. Some observers say that the green mamba is a tree snake, while the black one is not. I am in a position, from constant observation, to certify

that a black mamba is an extraordinarily nimble climber, and takes refuge aloft as often as in the ground. The truth may perhaps be that while the young are entirely tree dwellers, some, when full grown, retain an individual preference for the life, and, remaining permanently among the branches of the large and leafy trees which grow near the sand-spruits, retain their bright colour, and in a country such as the Sabi are seldom noted.

Many tales are current of the ferocity of the mamba, and tradition and exaggeration have woven such a reputation round his name that its mere mention is often sufficient to send a shiver even through those who live far from his haunts. I am bound to say that I have noticed in South Africa that the farther people are from anywhere that a mamba is likely to be encountered, and the less experience they have of the snake, the greater is their fear of him, and the more dogmatic their assertions as to his deeds and misdeeds. This is, however, true of all dangerous animals ; distance invariably lends a terror to their names.

There is no denying, however, that the mamba is to be treated with the utmost respect and approached with the greatest caution. In the first place, its bite means almost certain and rapid death, and secondly, thanks to its great length, it can strike a man far above the protection afforded by boots and leggings. Its movements, too, are so incalculable and its pace so rapid that it is very difficult to get out of its way, even should it have no aggressive intentions. Fortunately, it is a very alert and watchful creature, early detecting the approach of danger, and at once making with all speed for its hole. Should man or beast be unlucky enough to be between it and that refuge, it will strike desperately

in passing, and the results will be none the less serious that the blow has been given in fear and not in malice. When its course lies fortunately in some other direction, it then presents an interesting and beautiful sight. The slender head is held high in the air, and sweeps forward and sideways as the body glides over the ground in a series of graceful undulating curves nearly at the pace of a horse's gallop. At times nearly half the body seems to be off the earth, and it is this method of progression, so different from the wriggling movements of other snakes,




A BLACK MAMBA

which has given rise to the assertion that the mamba "goes on its tail."

It is found in bush and forest country and amongst rocks. A great deal of its hunting is done among the branches of trees, where it seizes small birds, squirrels, and other arboreal creatures. It glides amongst the twigs, and even from tree to tree, with wonderful speed and ease, and its partiality for shade, when obtainable, is soon discovered by any one who grows grenadillas or other thick creepers. Ant-bear, porcupine, and other burrows, discarded by their rightful owners, are used as refuges, and therein, as well as in the hollow trunks

of old trees, are eggs laid and young born. When searching in the latter places for genets or other mammals, it is always well to take heed lest a mamba be unwittingly disturbed.

Rough stony kopjes covered with long grass are almost certain to contain mambas, and caution should be exercised in walking about such places during the hot weather I was once riding along the bank of a river, and in passing under a thorn tree my hat happened to get knocked off, and fell a few feet behind my pony's tail, so pulling up I dismounted to recover it. On the near side of the animal was the tree which had caused the mishap, while on the off side, about two yards away, lay a large ant-bear hole. Just as I was stooping to pick up the hat there was a rustle amongst the bush and grass lying at the foot of the tree, and out came a mamba, which made straight for the hole, the way whereto took him straight below my pony's body. When he was exactly underneath it he suddenly caught sight of me, stopped short, and, raising his crest about a foot, looked fixedly at me, the forked tongue darting in and out. It was a very critical moment, for though a shot-gun was in my hands, I could not fire through the pony's hind legs, and the slightest movement on its part would, I knew, mean its certain death. The strain must have lasted for nearly half a minute, and an uncommonly long half-minute too, and all the time the pony, an old favourite, trained like all veld-bred horses, to stand quite still with the reins over its head, stood motionless, calmly masticating a tuft of grass. Suddenly the snake dropped his head, and, making a dive for the hole, disappeared down it, to my inexpressible relief. It is at such moments that one knows the meaning of " having one's heart in one's mouth."

Another time fortune was less kind. I had brought down my wagon to a point on the Crocodile River about eight miles from Komati Poort, and, the oxen having been outspanned and watered, I rode into the village, meaning to spend the night there. After dark a messenger followed me in, to say that two of the oxen had been killed by a mamba. I went out and found the best leader in the span dead, and one of the after oxen in a very bad way. The former had lived about two hours after being bitten, while the latter survived until the morning in a partially unconscious condition. It seemed that shortly before sunset the beasts had grazed into a patch of long grass, where they disturbed a mamba. The snake immediately charged through the herd, as usual, striking right and left as it went. One ox was struck high up in the hind leg and the other in the shoulder.

A little fox terrier of mine ran in at a mamba which I had disabled, but which was not yet dead. The snake had just strength left to bite the dog in the thigh, and expired immediately afterwards. In view of the former's weak state, I hoped for the best, and picking up the dog in my arms ran for the station, only 200 yards distant. Before I got there he was sick, in a few minutes more quite limp, and, in ten minutes from the time he was bitten, stone dead! This gives an idea of the rapid action of the poison on a nervous animal.

Many years ago the colonel of a British infantry regiment was killed by a mamba in Zululand. He had walked up to a deserted native village—always a likely spot for one of these snakes—to look for a suitable camping ground for his men, when he was bitten in the thigh. Telling the adjutant, who alone had accompanied him, to run back quickly for medical help,

the colonel sat down to administer what first aid he could to himself; but when assistance arrived, ten minutes or so later, he was dead. I once had a luckier escape than I deserved from being bitten. As I was walking through the bush a snake of some kind rustled off through some long grass on the left, and I just caught a glimpse of its tail disappearing down a hole. The native with me said it was a python, so I walked up to the hole—a large one—and peered in. I soon saw in the semi-darkness what appeared to be part of a small python coiled up a few feet down the hole, so I fired at it with the little collector's gun I was carrying. Instantly something shot out of the hole like a big released watch-spring, and came within three inches of my leg. It was a mamba. Needless to say I lost no time in placing a certain amount of distance between us. I suppose he was too much injured by the shot to do more than make one lunge, for on my returning armed with a double-barrelled gun he had vanished down the hole.

Mambas are not, under ordinary circumstances, in the least aggressive, and, in fact, their great object is to escape from man's presence as fast as possible. It is, as with other snakes, the instinct of self-protection alone which prompts them to strike. So-called charges are usually but efforts to get away to some hiding-place. I have never seen a wounded one attack, though they often raise their heads threateningly, and no doubt would lunge, if one came close enough to them. In any case, a man armed with a shot-gun, or even a stout stick, ought to be perfectly safe, provided—and there lies the risk—he has time to use his weapon. However, there are exceptions to every rule, especially where wild animals are concerned, and the following is a reliable instance of one: Wolhuter was riding along a native path one day

in the summer of 1910. Suddenly, out of the long grass, not ten feet in front of his horse's nose, a mamba raised its crest a good four feet from the ground, and appeared determined to dispute passage. Snatching his horse quickly round. Wolhuter stuck the spurs in and went off at best speed for fifty yards or more, when he pulled up and looked back. He could then see the mamba's head above the grass, its eyes still watching him, and from its position he judged it had come after him for about a dozen yards. In about eighteen years' residence in the bushveld, he said it was the only instance he ever knew of such a thing happening, and no doubt, had it been possible to investigate, some reason outside sheer vice would have been found justifying the animal's conduct.

The female mamba is rather larger than the male, which may be distinguished by its more slender and whippy tail.

The largest individual I ever killed measured about ten and a half feet, and one of that length would, at its thickest part, be of about the girth of a man's wrist.

After the mambas, the most dangerous members of the family are the cobras, of which there are several species. Their bite is deadly; but as they seldom exceed five or six feet in length, they cannot strike so high as a mamba; nor have they the rushing habits which render the latter so formidable. When excited they can expand the skin of the neck, thus forming what is known as the "hood." Members of the genus are found all over Africa wherever forest or scrub exists and the climate is sufficiently warm.

THE BLACK-NECKED COBRA. This is the commonest species in the Sabi Bush of the eastern Transvaal. The members of it favour as dwelling-places the crevices of rocks and the interstices between large stones. A rough-

built and unmortared wall is therefore certain to hold a number of them. They are the greatest pests to the poultry yard that it is possible to imagine, and, chiefly on their account, fowls must at night be enclosed in pens entirely covered with fine-meshed wire netting. Even when this precaution has been taken, they have a marvellous knack of discovering the least flaw or hole, and of squeezing themselves through. Having got inside, they proceed to slaughter the fowls wholesale, apparently for the sole purpose of finding out if they are sitting on young chickens in the fluffy stage, for they are not big enough to eat large poultry, and they do not touch eggs. I have found as many as fourteen fowls dead in the morning, besides all the young chickens that happened to be with them. Often, luckily, the marauder is so bulged out with his meal, that the crevice whereby he entered will not admit of his depature, and so he suffers for his crime. These cobras are also rather prone to enter dwelling-houses, perhaps in pursuit of rats and mice ; they can get in by ventilators and apertures at some distance from the ground. Thatched roofs are their favourite haunts, and, since the appearance of a poisonous snake falling on to the table or the bed is an unpleasant one, it is always well, when possible, to have cottages in snake-infested countries roofed with iron, or, failing this, to interpose a ceiling of boards or canvas between the room and the roof.

In addition to inflicting a dangerous bite, the black-necked cobra has also a very unpleasant habit of ejecting venom from its fangs into the eyes of its enemies at a distance of several feet. I had an unpleasant personal experience of this once. I was in a dark outhouse one rainy morning, when I suddenly felt a spatter of moisture first in one eye and then in the other, repeated instantly

in the left one. Smarting was followed in a minute or two by intense pain, and complete loss of sight. Fortunately, assistance was at hand, and the eyes were treated continuously for three hours with fresh milk squeezed liberally into them. The clot of blood with which each was covered then came away, and the surface, though much inflamed, became visible. The milk appeared to possess the power of coagulating with and sucking up the venom. It was a great relief to discover that I was not permanently blind, as I had feared; but bandages were necessary for a couple of days, and blue spectacles for a month. At the end of that time recovery seemed complete, and then there came a relapse, the left eye, which had received a double dose of poison, giving way, and causing me considerable inconvenience for a long time. The snake, which was killed and skinned during my period of prostration, proved to be a black-necked cobra. Wolhuter once had a similar accident, a cobra being under his dining-room table; but in his case the dose of venom was a slight one, and recovery was rapid and complete. Many of our domestic animals, dogs, calves, and, on one occasion, a foal, have completely lost the sight of one or both eyes in this manner, and solitary natives, unlucky enough to meet with such an accident in the bush, far away from water, are said to experience like results.

THE RINGHALS is a first cousin of the cobra group, and, though foreign to the eastern low country of the Transvaal, is well known as a spitting snake throughout the more civilized parts of south Africa. Its bite is dangerous, and it is marked in black and brown, deriving its name from the white band or bands on its neck.

The black-necked cobra is the only representative of the hooded tribe I have met with in the neighbourhood

of the Sabi, but further north, and elsewhere, the banded or Egyptian cobra is found in the Game Reserve, and the dogs of a ranger, in killing one, suffered severely. It is often quite impossible to restrain dogs from chasing and worrying snakes, they seem—especially terriers—to have no idea of the danger.

THE CORAL SNAKE also belongs to the cobra family. It is a very handsomely marked little snake about two feet long, banded with orange and black bars. It appears to be largely a tree snake, In examining the nests of a big colony of weaver birds, which had taken possession of a tree in the compound at Sabi Bridge, we found about half a dozen of these snakes, apparently with permanent quarters there. They must have fared sumptuously, as they were all stuffed with nestling birds. They are of course poisonous, like the rest of their family.

THE SHIELD SNAKE is another poisonous member of the cobra family, though, like the coral snake, it is not a true cobra. It has a black head and neck, and a brownish body with dark bands. I once stumbled on one of these gentry while looking for some tools in a box, in one corner of which he had snugly ensconced himself. He was, however, considerate enough to hiss loudly, and so give notice of his presence.

The various species of garter snakes likewise are akin to the true cobras. They are all brightly marked in red or yellow and black, banded or spotted.

## CHAPTER XVI

### POISONOUS SNAKES : VIPERS : BACK-FANGED SNAKES

THE PUFF ADDER. As it is its great quickness and activity which render the mamba so formidable, so the

puff adder is dangerous mainly from attributes of exactly a contrary nature. In Africa it is the most deadly and probably the most widely spread of all the viper tribe. It is handsomely marked in a " carpet pattern " of brown and yellow of varying shades. In shape it is short and thick, slow moving and sluggish by habit. The fangs are unusually long, and the bite very deadly. Owing to its sleepy disposition, the puff adder seldom hears the approach of footsteps ; and, as it enjoys basking in the sun, stretched at full length across a footpath, the danger of accidentally treading upon it is considerable, if a sharp look-out is not kept. When roused, and frightened or angry, it can strike with the speed of lightning, the blow being delivered more or less sideways. It also likes to creep into sheltered corners for warmth, and sometimes is found sleeping in the folds of blankets and clothes in camp.

These vipers take no inconsiderable toll of both domestic and wild animals, possibly more than any other kind of snake. When camping out one cold night in June, a favourite Irish terrier, seeking a warm corner to curl himself up in, unluckily chose the winter quarters of one of these brutes, and was bitten in the head. I did not discover what had happened until the morning, when it was too late to save him, though he lived all that day Another time two donkey foals were bitten in their pen one moonlight night, by a puff adder, which, presumably, they had curiously sniffed at as he was making his way across. One was already dead when found in the morning, and the other expired in the course of the day. A puff adder often hangs on and worries after having inserted its fangs, and, though the action of the venom is slower than that of mambas and cobras, the depth of the wounds renders them difficult of treatment. Puff adders do not lay eggs.

THE NIGHT ADDER. This is another viper which is very common in south Africa. It is often found in and near dwellings, and, like the puff adder, is so sleepy by nature, that it is liable to be trodden upon accidentally. The bite, though dangerous, is not necessarily fatal, and the reptile, being not more than a foot long, cannot strike very high. I have often seen my cats eating night adders which they had caught and killed.

This species lays eggs.

THE HORNED ADDER, also a dangerous viper, is usually found in sand regions, and frequents the western portions of south Africa; an allied species the Horned Puff Adder —exists in the Transvaal and other parts of the subcontinent. Both have a nasty habit of lying concealed in loose sand, where they are practically invisible until trodden upon. These two species have little horn-like scales above the eyes.

Several species of vipers are burrowers by habit, and so are not often met with; but all are poisonous and dangerous.

Besides the cobras and the vipers, there are a large number of species known as Back Fanged snakes, a term which means that their poison fangs are set, not in front, but far back in their jaws. It is therefore much more difficult for these snakes to inflict a bite than it is for the front fanged snakes to do so. In fact for a long time it was assumed that these back fanged snakes were harmless, though it is now known that if they can secure a grip they can many of them inflict a most dangerous bite.

Of these is the Tree Snake or Boomslang which, like the mamba, may range in colour from green to black, and has a conspicuously large eye. It attains to as much as five feet in length.

A very common species of back fanged snake in the Sabi Bush is the long, whippy, and very active Sand or Grass Snake, which is easily recognized by being marked lengthways in yellow and green or black stripes. These snakes are, practically speaking, harmless to man and the domestic animals, but they do a good deal of damage to young wild birds. A pair of wire-tailed swallows once built a nest on my veranda, in which they had brought out and successfully reared several young ones. All of these except one had left the nest, though they and the parent birds would return to it at night. The backward youngster, which was a day or two behind the others in acquiring enough strength to fly, was left all day alone in the nest, and fed at intervals. One day I heard a great noise, and going out found the old swallows fluttering round the nest. From the eaves of the roof protruded the head and fore part of a grass snake which had seized the young swallow, and was trying to drag it back under the roof. The bird was struggling desperately. On seeing me the snake let go its prey, which fell to the ground, and I picked it up still alive, but after a few struggles it died, evidently having received a poisonous bite from the snake.

The Tiger Snake is another of the same family, and is a yellowish snake, spotted with brown ; it also is a great hunter of young birds and has been found busy in a weaver bird colony.

The Red-lipped Snake is to be distinguished from its upper lip being of a bright red colour ; it has large light brown-coloured scales and a black band on its head. Like the preceding, its fangs are set too far back to be very dangerous. It is a small snake, seldom exceeding a couple of feet or so in length, and lives mainly on rats, mice, lizards, frogs and insects

# PART III

## FRESH-WATER FISH

### CHAPTER XVII

TROUT : CARP : TIGER FISH : BARBER : YELLOW FISH : MISCELLANEOUS

A VAST field of study and discovery yet awaits the naturalist among the fishes of Africa, and at present there is no work in existence which deals with them comprehensively. This lack of recorded description is in no way due to want of material to work upon, for most of the rivers, lakes, and pools of the continent swarm with native species. Exceptions are some of the rapid-flowing and cool streams which drain the uplands of south Africa ; and these, destitute of natural denizens, have been wisely utilized for the introduction of rainbow and brown trout. The experiment was first made, if my memory serves me correctly, in the Mooi River in Natal, about 1890, and so successful did it prove that it was extended to many other streams of a similar character in south Africa.

At the present day very high-class trout fishing is to be had both in Natal and in the Transvaal, and in the latter Province the trout hatchery at Potchefstroom, which receives a small Government grant in aid, produces annually an immense number of fry, which are distributed in suitable waters through the country. The expenditure for 1910 was under £600, and a credit

balance was shown. The law forbids the taking of trout by any other means excepting by angling with the fly, and thus due increase is ensured, for in the chosen localities there are few natural enemies to contend with.

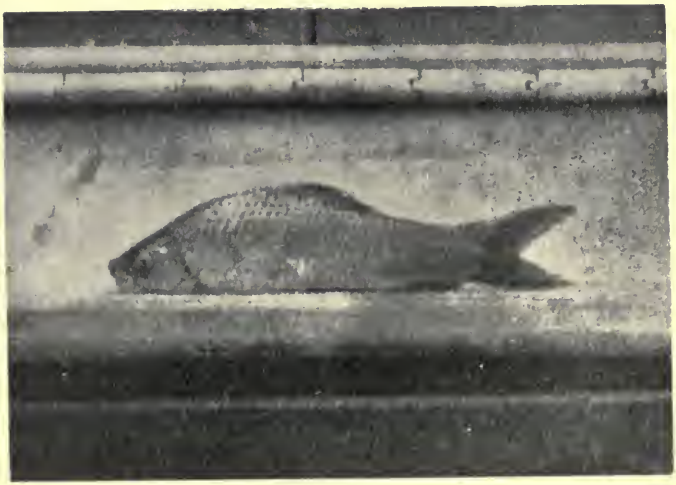
Trout in south Africa grow in size and numbers at a rate unknown in Europe. Some rainbow fry were turned into a Swaziland stream in October 1908, and in November 1909 Mr. R. T. Coryndon, the Commissioner, landed one weighing two and a quarter pounds, which must be nearly a record in rapid growth. This trout, the first ever caught in Swaziland, is now modelled among Mr. Coryndon's many other trophies of the field. Acclimatization has also been successfully carried out as far north as British Nyasaland, where the trout have taken kindly to the mountain streams of the highlands near Zomba.

It is said that on the whole the rainbow trout has been found more suitable to south African waters than the British form. On the Mooi River and elsewhere fish of from four to six pounds in weight are constantly taken by anglers. It remains to be seen to what size those turned into the deep artificial lakes and reservoirs near Johannesburg may eventually attain.

European carp have likewise been introduced to many of the dams and reservoirs with great success. It has proved to be a very popular fish in the country, and the Trout Acclimatization Society receives applications for small fish from all over south Africa. From the Kleinfontein Dam, which was stocked in 1904, several tons weight of carp were captured in 1910.

The Tiger Fish. Of all the fish native to south Africa, the tiger fish stands out easily the king. Of slender and graceful build, covered with large silvery scales, ornamented on his sides with horizontal black stripes,

TIGER FISH



YELLOW FISH

his fins and forked tail of orange red, his personal beauty is as striking as his boldness and courage. His familiar name is not an inapt one. His mouth is armed with truly formidable teeth, set well apart, and fitting into sockets in the opposite jaw. They are conical, sharp as needles, and, in large specimens, fully a quarter of an inch long. His character is in keeping with his outward appearance, for his habits are essentially predatory, and, were it not for the crocodile, he would be chief tyrant of the waters which he makes his home. In all probability, too, he amply revenges himself upon the newly hatched reptiles for the toll which the larger ones exact from his species.

Found only in the waters of tropical and semi-tropical countries, the favourite haunts of the tiger fish are deep still pools at the tails of streams, whose banks, closely fringed with dense reeds, afford secure ambush where he can lie in wait for, and dart out upon his prey. There is some doubt as to the size attained by tiger fish. It is said that in large rivers, like the Zambezi, they will exceed thirty pounds weight ; but the largest I ever saw caught there scaled sixteen. In the Crocodile River of the Transvaal, where "tiger fishing" has become a recognized pastime, I do not think that the fourteen-pounder caught by Major Greenhill-Gardyne in 1902 has yet been surpassed. The largest I ever landed myself from the Sabi scaled a few ounces under nine pounds.

These fish give the most magnificent "play" when hooked. As soon as one, having taken the bait, feels the prick of the steel, he dashes off in a series of magnificent rushes, bounding again and again out of the water shaking his head, and using every effort to get free. He will scarecely ever sulk, and should he do so for a time, it is only as a prelude to yet more vigorous action.

His teeth debar the possibility of holding him with anything but a specially made cast of steel tracing, and, even when such formidable tackle is made use of the reel must be allowed to run freely, else, if a big fish is in question, the top of the rod may go.

The method of angling usually pursued is to troll with a spoon bait about an inch long. There must be plenty of small but very strong hooks attached by swivels and rings (no gimp) to the spoon. The mouth of the tiger fish is so hard and bony that it is very hard for a single hook to get a grip, and very careful play is always necessary. Fortunately for the angler, the fish always comes with a furious rush, and gulps the bait at once, when the hooks, as often as not, become fixed in the gills, implying his certain capture provided the tackle does not give way. This last misfortune is quite likely to occur should there be the slightest flaw in the line, tracing or hooks. On the whole, I doubt if there be a fish in the world which for its size can put up so game a fight. A five-pound tiger fish may give from twenty minutes to half an hour's hard play, if one is using a twelve-foot trout rod. How long would it take to land a trout or grilse of the same size, using similar tackle ?

When the fish are not hungry, they will follow the spoon and smell at it ; it is then a good thing to place a small piece of raw meat or a fish-scale on the tail hook. Raw meat or fish alone is sometimes used as a bait, and I once hooked and landed a small one, using a red salmon fly with silver binding ; but though I often tried, I was never again successful in getting a tiger fish to take a fly. Given that they are hungry, numerous, and of fair size, there are few amusements more enjoyable and exciting than the pursuit of tiger fish, and I shall always look back to a day on the Olifants when I landed a dozen and

a half, scaling between two and five pounds, as a red-letter day in my fishing experiences.

The best time to fish is from about half an hour after sunrise up to about ten o'clock, and again from about four o'clock until sunset. During the winter months, when the water is cold, they do not take well, and again, after the commencement of the rains, the discoloured rivers bring down such quantities of food, and render the capture of other finny prey so easy that it is pure chance if they will even notice your bait. In south-east Africa the best period probably is from the beginning of August until the end of October; but sport may be obtained at any time during the hot weather, provided the water is clear.

However engrossed in his pursuit the angler may become, he must not forget that he is fishing in a pool which probably contains one or more crocodiles. The fact of his not seeing any indications of them is no proof that they are not present and eagerly watching him; so, whether in casting or in playing a fish, it is well to be careful. Wading, even in shallow water, is sheer foolhardiness, and that a man may have done so on scores of occasions with impunity does not alter the case in the least.

Tiger fish usually prefer to kill their own food, which consists of practically everything else that they can overpower, and they are in no sense scavengers or bottom feeders. Meat, to be successful as a bait, should be fresh, as it is the smell of blood which principally attracts them. No doubt they also devour grubs and insects brought down by the stream, but these are always inferior as baits. Big tiger fish will often rise at swallows skimming along the surface of the water.

Perhaps following the law of nature which controls

*Sabi Game Reserve, Photo*

ANGLING FOR TIGER FISH

the too great increase of predatory creatures, tiger fish are seldom found in such numbers as the other species which exist in the same waters. Looking from above into a clear pool amongst the swarms of yellow fish and smaller fry of all kinds, at most two or three large tiger fish, and a few smaller ones, are to be seen cruising about like men-of-war among a lot of merchantmen and fishing craft.

They are excellent eating when a little above three pounds in weight, but below that size the number of small, and apparently unattached, bones present is a drawback.

THE BARBER. This curious and rather repellent-looking creature belongs to the catfish tribe. Its enormous bony head, flat and adorned with long feelers, is almost equal in size to the rest of its body. It is one of the best known fish in Africa, and attains a length of four or five feet. Unlike the tiger fish, it is a bottom feeder, a lover of deep, still holes, with muddy groundwork. It can be caught with any kind of ground bait, and I have sometimes been successful with the spoon, and once with a salmon fly. When hooked, it makes a tremendous rush, which, when a large fish is concerned, strains rod and tackle to the utmost ; but after this it usually settles down to sulk, seeking the bottom and burying its nose in the mud. A strain on the line may induce another long run, and it will do its best to tangle the line in any drift wood, weeds, or debris collected under the water. If kept on the move, its efforts soon become less strenuous and it can be drawn ashore ; but, having got it there, the angler's difficulties are not yet at an end. In fact, the barber is one of the most difficult creatures in existence to kill, and the only certain way is to cut off his head. If this is not done, he will probably manage to

wriggle back into the water, though laid on the bank yards away from it.

The barber is really not very far removed from being an amphibious animal, for he is able to live for hours completely out of the water, and if placed in a bucket or basket with plenty of wet grass, there appears to be no limit to the period he can exist. When the forest pools dry up in the winter, barbers often bury themselves completely in the mud, and hibernate until the next rainy season arrives. Thus quite large bags can be made by digging in pools which contain nothing but mud and ooze. Several species occur in south Africa. The flesh is fairly good eating if well cooked; but if merely boiled, it is very dry and tasteless.

Probably the largest family of all the south African fishes comprises the various kinds of barbel (which must not be confused with the *barber* or catfish mentioned above), the carps, breams, and so called "suckers."

The barbels are very similar in appearance to the European type of the same name. Some sixty different kinds have been described in the annals of the South African Museum, and they are of all sizes from only a few inches up to nearly a foot in length. Most of them have little appendages hanging from the jaws which give them their name (meaning the bearded ones). One kind, when lifted, stings the hand like a bunch of nettles.

The curious fishes, locally called suckers, also run into a large number of species. Their mouths are very much on the underside of the jaw, and they possess thick rubbery lips forming a sort of adhesive pad which enables the owner to hang on to the rocks and stones from which no doubt he sucks the lichens and other vegetable food which form his food. A species very common in the Sabi River, Transvaal, attains quite six pounds weight (at

least I have shot them up to that size—I never succeeded in catching any). These queer fish like to attach themselves to the rocks at the sides of very deep and swift running streams, in which position, and about a foot or two beneath the surface, they will remain for hours. They have no teeth.

THE YELLOW FISH. This is the commonest fish of south Africa, and is found in water at all elevations. It grows to a large size, having been taken up to as much as thirty pounds weight on the Vaal River. It is rather a well-shaped fish, with large yellow scales. It is most easily captured with dough or paste, and, though naturally a bottom feeder, can sometimes be taken with an ordinary trout fly. It gives fairly good play, and is good eating. The best time to fish for it is from August to about May. In the Transvaal low country the spawning season takes place during the warm weather and, like those of most other local fish, the majority of the young fry are to be seen about the end of the rainy season.

There are a great many other and usually smaller carp and perch-like fishes which have scientific, but I think very few of them European names. The local natives have of course terms for the majority of them.

Towards the end of the dry season, the pools in the smaller rivers (which do not run all the year round) shrink to very small dimensions, and the number of fish cooped up in a few feet of muddy water is wonderful. This is the chance of the natives, coinciding as it does with the period when food is becoming scarce in the kraals. The women, laden with wickerwork fishing baskets, repair to the pools and scoop the unfortunate fish into their baskets and out on to the banks, literally in armfuls. In larger pools the fish are often driven by a line of men, boys, and women wading knee deep, into

a line of basket traps skilfully prepared for them at one end of the pool. On these occasions everything of edible size is taken home, but the very small fry are left on the bank to die or flap back into the water according to whether their luck is in or out. The variety of the catch is sometimes amazing. Many of the fish however, no doubt profiting by previous experience, are able to bury themselves temporarily in the mud, and so escape ; at any rate, there always seem to be a good many left the day after even the most strenuous hunt.

Sometimes there is a crocodile in the pool ; indeed, if it is more than three feet deep in any part there is quite likely to be one. The prospect of such an unpleasant denizen being present does not seem to deter the ladies in the least ; but if he shows himself there is a wild scurry for the bank. On one occasion about twenty women and small girls from some neighbouring villages were taking fish from a pool in the Manzemntonto River. The pool was about thirty yards each way and about two feet deep in most parts except in one end where under an overhanging bank there was a small hole about five feet deep. As it happened this was the lair of a crocodile some eight feet long. The people had of course seen the tracks on the banks, but with true native apathy persuaded themselves that he had gone away, or that he would be frightened of the noise. Anyhow the fishing was at its height ; every one was shouting and splashing through the water ; when the crocodile, which must have either been particularly hungry, or an exceptionally bold specimen of his tribe, having approached under cover of the mud stirred up, suddenly seized by the leg a woman who was somewhat apart from her companions, and close to the deep water. There was a tremendous commotion. A couple of men who were there to look

after the safety of their women folk, and were sitting on the bank close by, at once leaped in, and stabbed the crocodile about the eyes with their spears. The reptile, thus attacked, seemed to lose his head, let go the woman he was holding, and proceeded to dash about through the shallow water of the pool with his mouth open. The men pluckily chased him, but he had apparently had enough for the day, and having found his bit of deep water again, disappeared from sight. The woman was not much the worse for her experience, but it put an end to the fishing for that day.

In the Transvaal low country there are two types of eels, one is much like the ordinary fresh water European eel, the other considerably larger.

Of the vast number of different kinds of fishes inhabiting the temperate and sub-tropical waters of south Africa, it is possible to give but the merest outline. Many of them appear quite indifferent to the ordinary lures of the angler, and except among natives catches are but little likely to be seen by the white man who is not specially looking for them. It is quite worth while looking through a native catch, as you will probably see some most remarkable looking creatures.

The great African lakes are full of a vast multitude of fish, and a day on Lake Nyasa resulted in the catching of at least six different species, of the names of which, I regret to say, I was, and am, entirely ignorant.

# APPENDIX

## SOUTH AFRICAN BIRDS

(Families as per Gunning and Haagner 1910)

## *CLASS AVES*

Sub-class *RATITÆ* (no keel to breast bone)

Order STRUTHIONES

Family STRUTHIONIDÆ

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Struthio* | *australis* | Southern Ostrich (*Struisvogel*) |

Sub-class *CARINATÆ* (keel to breast bone)

Order IMPENNES

Family SPHENISCIDÆ

| | | |
|---|---|---|
| *Spheniscus* | *demersus* | Jackass Penguin (*Penguin*) |

Order PYGOPODES

Family COLYMBIDÆ

| | | |
|---|---|---|
| *Colymbus* | *cristatus* | Crested Grebe (*Zanddrijver*) |
| ,, | *nigricollis* | Eared Grebe (*Kleine Zanddrijver*) |
| ,, | *capensis* | Cape Dabchick (*Duikertje*) |

## Order TUBINARES

(Albatrosses, Mollymawks, and Petrels)

Family PROCELLARIIDÆ. Fourteen genera divided into twenty-seven species.

## Order GAVIÆ

(Skuas, Gulls, and Terns)

Family LARIDÆ. Six genera and twenty-one species.

## Order STEGANOPODES

### Family SULIDÆ

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Sula* | *capensis* | Malagash (*Kaapse Stommerik*) |
| ,, | *cyanops* | Masked Booby (*Blauwoog Stommerik*) |
| ,, | *sula* | Brown Booby (*Bruine Stommerik*) |

### Family PHALACROCORACIDÆ

| | | |
|---|---|---|
| *Phalacrocorax* | *lucidus* | White-Breasted Duiker (*Wit borstaalscholver of duiker*) |
| ,, | *neglectus* | Bank Cormorant (*Bank duiker*) |
| ,, | *capensis* | Cape Cormorant (*Trek aalscholver of duiker*) |
| ,, | *africanus* | Reed Cormorant (*Afrikaanse aalscholver of riet duiker*) |
| *Anhinga* | *rufa* | Snake Bird (*Slanghalsvogel*) |

## Family PELECANIDÆ

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Pelecanus* | *riscus* | Eastern White Pelican (*Grote pelikaan*) |
| ,, | *rufescens* | Pink-Backed Pelican (*Roodrug pelikaan*) |

## Order ANSERES

### Family ANATIDÆ

| | | |
|---|---|---|
| *Erismatura* | *maccoa* | Maccoa Duck (*Maccow eend*) |
| *Thalassornis* | *leuconotus* | White-Backed Duck (*Witrug eend*) |
| *Nyroca* | *capensis* | South African Pochard (*Bruine eend*) |
| *Spatula* | *clypeata* | European Shoveller (*Slop*) |
| ,, | *capensis* | Cape Shoveller (*Kaapse slop*) |
| *Anas* | *undulata* | Yellow-Billed Duck (*Geelbek eend*) |
| ,, | *sparsa* | Black Duck (*Zwarte eend*) |
| ,, | *erythrorhyncha* | Red-Billed Teal (*Roodbek eend*) |
| ,, | *capensis* | Cape Widgeon (*Kaapse smee-eend*) |
| ,, | *punctata* | Hottentot Teal (*Gevlekte eend*) |
| *Dendrocygna* | *viduata* | White-Faced Duck (*Nonnetje eend*) |
| ,, | *fulva* | Whistling Duck (*Fluit eendtje*) |
| *Nettapus* | *auritus* | Dwarf Goose (*Dwerg gans*) |
| *Sarkidiornis* | *melanotus* | Knob-Billed Duck (*Knobbel eend*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Chenalopex* | *ægyptiacus* | Egyptian Goose (*Nijlgans of Berg gans*) |
| *Plectropterus* | *gambensis* | Spur-Winged Goose (*Sporin gans of wilde makauw*) |
| *Casarca* | *cana* | South African Sheldrake (*Berg eend*) |

## Order LIMICOLÆ

Family CHARADRIIDÆ (Oyster Catchers, Pratincoles, Coursers, Plovers, Lapwings, and Thick-Knees or Dikkops). Thirteen genera and twenty-nine species.

### Family DROMADIDÆ

| | | |
|---|---|---|
| *Dromas* | *ardeola* | Crab Plover (*Krabbe kieviet*) |

Family SCOLOPACIDÆ (Curlews, Greenshanks, Redshanks, Sandpipers, and Snipe). Ten genera and thirty-two species.

## Order ALECTORIDES

### Family OTIDIDÆ

| | | |
|---|---|---|
| *Otis* | *kori* | Giant Bustard (*Gompauw*) |
| ,, | *cafra* | Stanley Bustard (*Veld pauw*) |
| ,, | *ludwigi* | Ludwig's Bustard (*Ludwigs pauw*) |
| ,, | *vigorsi* | Black-Throated Bustard (*Vaal koraan*) |
| ,, | *barrowi* | Natal Bustard (*Natal koraan*) |
| ,, | *cærulescens* | Blue Bustard (*Blauwe koraan*) |
| ,, | *ruppelli* | Ruppell's Bustard (*Blauwkop koraan*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Otis* | *ruficrista* | Red-Crested Bustard (*Bos koraan*) |
| ,, | *afroides* | White-Quilled Bustard (*Witvleugel koraan*) |
| ,, | *afra* | Black Bustard (*Zwarte koraan*) |
| ,, | *melanogaster* | Black-Bellied Bustard (*Zwartpens koraan*) |

Family GRUIDÆ

| | | |
|---|---|---|
| *Bugeranus* | *carunculatus* | Wattled Crane (*Lelkraan*) |
| *Anthropoides* | *paradisea* | Blue Crane (*Blauwe kraanvogel*) |
| *Balearica* | *regulorum* | Crowned Crane (*Kroon kraan of Mahem*) |

Order FULICARIÆ

Family JACANIDÆ

| | | |
|---|---|---|
| *Actophilus* | *africanus* | African Jacana (*Langtoon*) |
| *Microparra* | *capensis* | Lesser Jacana (*Kleine langtoon*) |

Family RALLIDÆ (Rails, Coots, Moorhens, Crakes, and Finfoot). Ten genera and sixteen species.

Order HEMIPODII

Family TURNICIDÆ

| | | |
|---|---|---|
| *Turnix* | *lepurana* | Kurrichane Button Quail (*Kurrichane riet kwartel*) |
| ,, | *nana* | Natal Button Quail (*Natal riet kwartel*) |
| ,, | *hottentotta* | Hottentot Button Quail (*Kaapse riet kwartel*) |

## Order PTEROCLETES

### Family PTEROCLIDÆ

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Pterocles* | *gutturalis* | Yellow-Throated Sandgrouse (*Nacht patrijs*) |
| „ | *variegatus* | Spotted Sandgrouse (*Gele zandpatrijs*) |
| „ | *bicinctus* | Double Banded Sandgrouse (*Dubbel gebande zandpatrijs*) |
| *Pterecluru*s | *namaquus* | Namaqua Sandgrouse (*Namaqua patrijs*) |

## Order HERODIONES

### Family IBIDÆ

| | | |
|---|---|---|
| *Ibis* | *æthiepica* | Sacred Ibis (*Heilige ibis*) |
| *Geronticus* | *calvus* | Bald Ibis (*Wilde kalkoen*) |
| *Theristicus* | *hagedash* | Green Ibis or Hadada (*Groene ibis*) |
| *Plegadis* | *autumnalis* | Glossy Ibis (*Glans ibis*) |
| *Platelea* | *alba* | Spoonbill (*Lepelaar*) |

### Family CICONIIDÆ

| | | |
|---|---|---|
| *Tantalus* | *ibis* | Wood Ibis (*Nimmerzat*) |
| *Anastomus* | *lamelligerus* | Openbill (*Openbek*) |
| *Leptophilos* | *crumenifer* | Marabou Stork (*Afrikaanse marabou*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Ephippiorhynchus* | *senegalensis* | Saddlebill (*Zadelbek*) |
| *Abdimia* | *abdimii* | White-Bellied Stork (*Groenbek ooievaar*) |
| *Ciconia* | *ciconia* | White Stork (*Witte ooievaar*) |
| ,, | *nigra* | Black Stork (*Zwarte ooievaar*) |
| *Dissoura* | *microscelis* | Woolly-Neck Stork (*Wolnek ooievaar*) |

Family PHŒNICOPTERIDÆ

| | | |
|---|---|---|
| *Phœnicopterus* | *roscus* | Greater Flamingo (*Grote flamingo of Vogelmink*) |
| ,, | *minor* | Lesser Flamingo (*Kleine flamingo*) |

Family SCOPIDÆ

| | | |
|---|---|---|
| *Scopus* | *umbretta* | Hammerhead (*Hamerkop*) |

Family ARDEIDÆ

| | | |
|---|---|---|
| *Nycticorax* | *nycticorax* | Night Heron (*Nacht reiger of kwak*) |
| ,, | *leuconotus* | White-Backed Night Heron (*Witrug nacht reiger*) |
| *Botaurus* | *stellaris capensis* | Cape Bittern (*Kaapse roerdomp*) |
| *Ardetta* | *minuta* | European Little Bittern (*Woudaapje*) |
| ,, | *payesi* | Red-Necked Little Bittern (*Roodnek woudaapje*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Ardetta* | *sturmi* | African Dwarf Bittern (*Dwerg reigertje*) |
| *Erythrocnus* | *rufiventris* | Rufous-Bellied Heron (*Roodbuik reigertje*) |
| *Butorides* | *atricapillus* | Green-Backed Heron (*Groonrug reigertje*) |
| *Melanophoyx* | *ardesiaca* | Black Heron (*Zwarte reiger*) |
| ,, | *vinaceigula* | Red-Throated Heron (*Roodkeel reiger*) |
| *Ardeola* | *ralloides* | Squacco Heron (*Ral reiger*) |
| *Ardea* | *goliath* | Goliath Heron (*Reuzen reiger*) |
| ,, | *purpurea* | Purple Heron (*Roode reiger*) |
| ,, | *cinerea* | Grey Heron (*Blauwe reiger*) |
| ,, | *melanocephala* | Black-Headed Heron (*Zwarthop reiger*) |
| *Bubulcus* | *ibis* | Cattle Egret (*Bosluis vogel*) |
| *Herodias* | *garzetta* | Little Egret (*Kleine Zilver reiger*) |
| ,, | *alba* | Large White Egret (*Grote Zilver reiger*) |
| ,, | *brachyrhyncha* | Yellow-Billed Egret (*Kortbek reiger*) |

## Order COLUMBÆ

### Family COLUMBIDÆ

| | | |
|---|---|---|
| *Vinage* | *delalandei* | Cape Fruit Pigeon (*Kaapse papegaai duif*) |
| ,, | *schalowi* | Northern Fruit Pigeon (*Groone papegaai duif*) |
| *Columba* | *phœonota* | Rock Pigeon (*Bos duif*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Columba* | *arquatrix* | Olive Pigeon (*Oliven duif*) |
| *Turtur* | *senegalensis* | Laughing Dove (*Lemoen duifje*) |
| ,, | *semitorquatus* | Red-Eyed Turtle Dove (*Grote tortel duif*) |
| ,, | *capicola* | Cape Turtle Dove (*Kaapse tortel duif*) |
| ,, | *capicola damarensis* | Damara Turtle Dove (*Damara tortel duif*) |
| ,, | *capicola tropicus* | Tropical Turtle Dove (*Tropise tortel duif*) |
| ,, | *ambiguus* | White-Bellied Turtle Dove (*Witpens tortel duif*) |
| *Turturoena* | *delagorguei* | Crimson-Winged Pigeon (*Roodvleugel duif*) |
| *Aplopelia* | *larvata* | Cinnamon Dove (*Kaneel duifje*) |
| *Tympanistria* | *tympanistria* | Tambourine Dove (*Witborst duifje*) |
| *Chalcopelia* | *afra* | Metallic-Spotted Dove (*Staalvlek duifje*) |
| ,, | *afra volkmanni* | Damara Metallic-Spotted Dove (*Damara Staalvlek duifje*) |
| *Œna* | *capensis* | Namaqua Dove (*Namaqua duifje*) |

## Order GALLINÆ

### Family PHASIANIDÆ

| | | |
|---|---|---|
| *Numida* | *coronata* | Crowned Guinea Fowl (*Wilde tarentaal*) |
| ,, | *mitrata* | East African Guinea Fowl (*Oostelijke tarentaal*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Numida* | *papillosa* | Damara Guinea Fowl (*Damara tarentaal*) |
| *Guttera* | *cristata edouardi* | Crested Guinea Fowl (*Kuifkop tarentaal*) |
| ,, | *lividicollis ghigi* | Pale-Necked Crested Guinea Fowl (*Zambezi kuifkop tarentaal*) |
| *Pternistes* | *swainseni* | Northern Red-Necked Pheasant (*Bosveld fazant*) |
| ,, | *nudicollis* | Southern Red-Necked Pheasant (*Kaapse bos fazant*) |
| ,, | *humboldti* | White-Ringed Pheasant (*Witring fazant*) |
| *Francolinus* | *capensis* | Noisy or Cape Francolin (*Kaapse patrijs*) |
| ,, | *adspersus* | Red-Billed Francolin (*Roodbek patrijs*) |
| ,, | *natalensis* | Natal Francolin (*Natal fazant*) |
| ,, | *levaillanti* | Cape Red-Wing (*Roodvleugel patrijs*) |
| ,, | *afer* | Grey-Wing (*Berg patrijs*) |
| ,, | *gariepensis* | Orange River Francolin (*Vrijstaat patrijs*) |
| ,, | *jugularis pallidior* | Eriksson's Francolin (*Eriksson's patrijs*) |
| ,, | *shelleyi* | Shelley's Francolin (*Shelley's patrijs*) |
| ,, | *coqui* | Coqui (*Swempie*) |
| ,, | *sephœna* | Crowned Francolin (*Kuifkop patrijs*) |
| ,, | *kirki* | Kirk's Francolin (*Kirk's patrijs*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Coturnix* | *coturnix africana* | African Quail (*Kwartel*) |
| ,, | *delagorguei* | Harlequin Quail (*Bonte kwartel*) |
| *Excalfactoria* | *adansoni* | Blue Quail (*Blauwe kwartel*) |

## Order ACCIPITRES

(Birds of Prey)

### Family VULTURIDÆ

| | | |
|---|---|---|
| *Ogotyps* | *auricularis* | Black Vulture (*Zwarte aasvogel*) |
| *Lophogyps* | *occipitalis* | White-Headed Vulture (*Witkop aasvogel*) |
| *Gyps* | *kolbei* | Griffen Vulture (*Gewone aasvogel*) |
| ,, | *ruppelli* | Ruppell's Vulture (*Rüppell's aasvogel*) |
| *Pseudogyps* | *africanus* | White-Backed Vulture (*Witrug aasvogel*) |
| *Neophron* | *percnopterus* | Egyptian Vulture (*Egyptise aasvogel*) |
| ,, | *monachus* | Hooded Vulture (*Monnik aasvogel*) |

### Family FALCONIDÆ

| | | |
|---|---|---|
| *Serpentarius* | *serpentarius* | Secretary Bird (*Slangenvreter*) |
| *Polyboroides* | *typicus* | Harrier Hawk (*Grote blauw havik*) |
| *Circus* | *pygargus* | Montague's Harrier (*Blauwe kuikendief*) |
| ,, | *macrourus* | Pallid Harrier (*Vale kuikendief*) |
| ,, | *maurus* | Black Harrier (*Zwarte kuikendief*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Circus* | *æruginosus* | Marsh Harrier (*Bruine kuikendief*) |
| ,, | *ranivorus* | South African Harrier (*Paddavreter*) |
| *Melierax* | *canorus* | Chanting Goshawk (*Grote blauw valk*) |
| ,, | *mechowi* | Mechow's Goshawk (*Donkere blauw valk*) |
| *Kaupifalco* | *monogrammicus* | African Buzzard Eagle (*Blauwe streep valk*) |
| ,, | *monogrammicus meridionalis* | Northern Buzzard Eagle (*Nordelike blauwe streep valk*) |
| *Astur* | *melanoleucus* | Black Sparrow Hawk (*Bonte sperwer*) |
| ,, | *tachiro* | African Goshawk (*Zuidafrikaanse havik*) |
| ,, | *polyzonoides* | Little Banded Goshawk (*Veelbanaige havik*) |
| *Accipiter* | *ovampensis* | Ovampo Sparrow Hawk (*Ovampo sperwer*) |
| ,, | *rufiventris* | Red-Breasted Sparrow Hawk (*Afrikaanse sperwer*) |
| ,, | *minullus* | Little Sparrow Hawk (*Kleine sperwer*) |
| ,, | *minullus tropicalis* | Pale Pittle Sparrow Hawk (*Noordelike kleine sperwer*) |
| *Micronisus* | *gabar* | Gabar Goshawk (*Kleine blauwvalk*) |
| ,, | *niger* | Black Goshawk (*Zwarte valkje*) |
| *Circætus* | *pectoralis* | Black-Breasted Harrier Eagle (*Uilarend*) |
| ,, | *fasciolatus* | Banded Harrier Eagle (*Gebandi uilarend*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Spizætus* | *bellicosus* | Martial Hawk Eagle (*Breedkop arend*) |
| ,, | *coronatus* | Crowned Hawk Eagle (*Gekroonde arend*) |
| *Hieraaetus* | *spilogaster* | African Hawk Eagle (*Hoender jager*) |
| ,, | *pennatus* | Booted Eagle (*Dwerg arend*) |
| ,, | *wahlbergi* | Brown Eagle (*Bruine arend*) |
| *Lophoætus* | *occipitalis* | Crested Hawk Eagle (*Kuifkop arend*) |
| *Aquila* | *verreauxi* | Black Eagle (*Dassie vanger*) |
| ,, | *rapax* | Tawny Eagle (*Kouwvogel*) |
| *Buteo* | *jakal* | Jackal Buzzard (*Jakhalsvogel*) |
| ,, | *augur* | Augur Buzzard (*Zwartrug buizerd*) |
| ,, | *desertorum* | Steppe Buzzard (*Vale buizerd*) |
| *Machæ-rhamphus* | *anderssoni* | Anderson's Pern (*Damara wespindief*) |
| *Helotarsus* | *ecaudatus* | Bateleur (*Berghaan*) |
| *Gypætus* | *ossifragus meridionalis* | Southern Lammergeyer (*Afrikaanse lammergier*) |
| *Gypohierax* | *angolensis* | Vulturine Sea Eagle (*Bonte zee arend*) |
| *Haliætus* | *vocifer* | Sea Eagle or Fish Eagle (*Zee arend*) |
| *Pandion* | *haliætus* | Osprey (*Vis arend*) |
| *Milvus* | *ægyptius* | Egyptian or Yellow-Billed Kite (*Geelbek wouw*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Milvus* | *korschun* | Black Kite (*Zwarte wouw*) |
| *Pernis* | *apivorus* | Pern (*Wespendiet*) |
| *Elanus* | *cæruleus* | Black-Shouldered Kite (*Blauw Volkje*) |
| *Baza* | *verreauxi* | Cuckoo Falcon (*Koekoekvalk*) |
| *Falco* | *peregrinus* | Peregrine Falcon (*Slecht valk*) |
| ,, | *minor* | South African Peregrine Falcon (*Kleine slecht valk*) |
| ,, | *biarmicus* | South African Lanner (*Zuidafrikaanse edelvalk*) |
| ,, | *subbuteo* | Hobby (*Boomvalk*) |
| ,, | *cuvieri* | African Hobby (*Afrikaanse boomvalk*) |
| ,, | *ruficollis* | Red-Necked Falcon (*Roodnek valk*) |
| *Cerchneis* | *vespertina* | Western Red-Necked Kestrel (*Roodpoot valk*) |
| ,, | *amurensis* | Eastern Red-Legged Kestrel (*Oostelike Roodpoot valk*) |
| ,, | *dickensoni* | Dickenson's Kestrel (*Dickenson's valkje*) |
| ,, | *rupicoloides* | Large African Kestrel (*Grote toren valk*) |
| ,, | *rupicola* | South African Kestrel (*Toren valk of rood valk*) |
| ,, | *naumanni* | Lesser Kestrel (*Kleine toren valk*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Poliohierax* | *semitorquatus* | Pigmy Falcon (*Dwerg valkje*) |

Family STRIGIDÆ

| | | |
|---|---|---|
| *Scotopelia* | *peli* | Pel's Fishing Owl (*Vis uil*) |
| *Bubo* | *lacteus* | Giant Eagle Owl (*Reuzen ooruil*) |
| ,, | *ascalaphus trothæ* | Damara Eagle Owl (*Damara ooruil*) |
| ,, | *capensis* | Cape Eagle Owl (*Kaapse ooruil*) |
| ,, | *maculosus* | Spotted Eagle Owl (*Gevlekte ooruil*) |
| *Asio* | *nisuella* | Marsh Owl (*Vlei uil*) |
| ,, | *leucotis erlangeri* | White-Faced Owl (*Witwanguil*) |
| *Pisorhina* | *capensis* | Cape Scops Owl (*Kleine ooruil*) |
| *Syrnium* | *woodfordi* | Bush Owl (*Bos uil*) |
| *Glaucidium* | *capense* | Barred Owlet (*Gestreepte uiltje*) |
| ,, | *perlatum* | Pearl-Spotted Owlet (*Parel uiltje*) |
| *Strix* | *flammea maculata* | Cape Barn Owl (*Kaapse kerkuil*) |
| ,, | *capensis* | Grass Owl (*Gras uil*) |

Order PSITTACI

Family PSITTACIDÆ

| | | |
|---|---|---|
| *Poicephalus* | *robustus* | Red-Shouldered Parrot (*Grote papegaai*) |
| | ,, *suahelicus* | Red-Crowned Parrot (*Roodkop papegaai*) |

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Poicephalus* | *meyeri* | Meyer's Parrot (*Meyer's papegaai*) |
| ,, | *ruppelli* | Brown Parrot (*Bruine papegaai*) |
| ,, | *fuscicapillus* | Brown-Headed Parrot (*Bruine kop papegaai*) |
| *Agapornis* | *roseicollis* | Rosy-Faced Lovebird (*Roodkop parakiet*) |
| ,, | *nigrigenis* | Black-Faced Lovebird (*Zwartwang parakiet*) |
| ,, | *lilianæ* | Nyasa Lovebird (*Nyasa parakiet*) |

## Order PICARIÆ

### Sub-order *COCCYGES*

### Family MUSOPHAGIDÆ

| | | |
|---|---|---|
| *Chizærhis* | *concolor* | Grey Lourie (*Kweevogel*) |
| *Gallirex* | *chlorochlamys* | Zambezi Purple-Crested Lourie (*Zambezi blaukuif loerie*) |
| ,, | *porphyreolophus* | Purple-Crested Lourie (*Blaukuif loerie*) |
| *Turæus* | *corythaix* | Cape Lourie (*Gewone loerie*) |
| | ,, *phœbus* | Transvaal Lourie (*Transvaalse loerie*) |
| ,, | *livingstonei* | Livingstone's Lourie (*Livingstone loerie*) |
| ,, | *reichenowi* | Reichenow's Lourie (*Reichenow's loerie*) |

Family CUCULIDÆ (Bush Cuckoos or Coucals and Cuckoos). Six genera and nineteen species.

## Sub-order *ZYGODACTYLI*

Family INDICATORIDÆ (Honey Guides). Two genera and five species.

Family CAPITONDIDÆ (Barbets and Tinkerbirds). Five genera and eleven species.

Family PICIDÆ (Wrynecks and Woodpeckers). Five genera and twelve species.

## Sub-order *ANISODACTYLI*

Family COLIIDÆ (Mousebirds or Colies). One genus, seven species.

### Family TROGONIDÆ

| GENUS | SPECIES | ENGLISH AND S.A. DUTCH NAMES |
|---|---|---|
| *Apaloderma* | *narina* | Narina Trogon (*Bos loerie*) |

Family CORACIIDÆ (Rollers). Two genera and seven species.

Family BUCEROTIDÆ (Hornbills). Three genera and nine species.

Family ALCEDINIDÆ (Kingfishers). Five genera and ten species.

Family MEROPIDÆ (Bee-Eaters). Four genera and seven species.

## Sub-order *UPUPI*

Family UPUPIDÆ (Hoopoes). Three genera and four species.

Family CAPRIMULGIDÆ (Nightjars). Two genera and eight species.

## Sub-order *CYPSELI*

Family MACROPTERYGIDÆ (Swifts). Three genera and nine species.

Order PASSERES (or Perching Birds)

Family PITTIDÆ (Long-Winged Pitta). One genus and species.

Family HIRUNDINIIDÆ (Swallows). Five genera and eighteen species.

Family MUSCICAPIDÆ (Flycatchers). Eighteen genera and thirty-four species.

Family CAMPEPHAGIDÆ (Cuckoo Shrikes). Two genera and four species.

Family LANIIDÆ (Shrikes). Thirteen genera and twenty-nine species.

Family CORVIDÆ (Crows, Rooks, and Ravens). Three genera and three species.

Family DICRURIDÆ (Drongos). One genus and two species,

Family ORIOLIDÆ (Orioles). One genus and three species.

Family STURNIDÆ (Oxpeckers and Starlings). Eight genera and fourteen species.

Family PLOCEIDÆ (Weaver Birds). Seven genera and twenty-three species.

Family SPERMESTINÆ (Weaver Finches, Bishop Birds. Widow Birds, Waxbills, and Widow Finches). Twenty-one genera and forty-four species.

Family FRINGILLIDÆ (Sparrows, Finches, Canaries, Seed-Eaters, and Buntings). Eleven genera and thirty species.

Family MOTACILLIDÆ (Wagtails, Pipits, and Longclaws). Five genera and nineteen species.

Family ALAUDIDÆ (Larks). Ten genera and twenty-nine species.

Family PYCNONOTIDÆ (Bulbuls). Three genera and eleven species.

Family ZOSTEROPIDÆ (White-Eyes). One genus, six species.

Family NECTARINIIDÆ (Sun Birds and Sugar Birds). Five genera and twenty-five species.

Family CERTHIIDÆ (Spotted Creeper). One genus and species.

Family PARIIDÆ (Tits, Titbabblers). Three genera and twelve species.

Family SYLVIIDÆ (Grass Birds and Warblers). Twenty-one genera and seventy-four species.

Family TURDIDÆ (Babblers, Chat-Warblers, Rock-Jumpers, Thrushes, Chats, Robins, and Nightingales). Nineteen genera and fifty-one species.

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